THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Legal Compilation

Statutes and Legislative History
Executive Orders
Regulations
Guidelines and Reports

Supplement II
Volume II
Water

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JANUARY 1974

RUSSELL E. TRAIN
Administrator

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FOREWORD

America's journey to environmental awareness has been a relatively recent one. Not so many years ago Americans were still living under the illusion that a land as vast as ours was blessed with indestructible natural resources and beauty.

We continued the exploitation of those resources and scattered unplanned communities across huge areas of open space. Large amounts of fuel were needed for the autos that took us to work from distant suburbs, and the air became laden with their dense emissions. Pesticides were used indiscriminantly by persons unaware of their effects on the food chain of plants and animals. Our rivers became contaminated with waste from homes and industries. Our landscape was marred by litter.

As the environmentalist movement gained impetus, attention was focused on these matters. Rachael Carson's book, *Silent Spring*, in 1962 awakened Americans to the hazards of pesticides. The oil spills of the Torrey Canyon in 1967 and at Santa Barbara, California in 1969 dramatized another environmental hazard. The first Earth Day on April 20, 1970, a coordinated program of teach-ins across the nation, helped to focus Congressional attention on the strength of the environmental movement.

Congress responded by approving the President's Reorganization Plan No. 3 which expanded the federal commitment to environmental concerns and consolidated 15 Federal organizations under the Environmental Protection Agency.

At the same time, Congress began enacting far-reaching legislation to provide EPA with specific authority for controlling pollution. These measures included the Clean Air Amendments in 1970, and the Federal Water Pollution Control Act Amendments, Federal Environmental Pesticide Control Act, the Noise Control Act, and the Marine Protection, Research and Sanctuaries Act, all in 1972. Congress also passed the Resource Recovery Act in 1970 and extended the Solid Waste Disposal Act in 1973.

As the Agency began taking action under these laws, Americans gradually realized that very real changes were required in our accustomed ways of doing business. We realized that our effort frequently conflicted with powerful and legitimate interests in both the public and private sectors. Our administrative, judicial and political processes now have the task of resolving these conflicts. They must do so by weighing all the interests which are affected in a sensitive and informed manner. Quick access to the legal dimensions of these problems is essential if conflicts are to be efficiently and fairly resolved.

The work of the present day environmentalist is less glamorous than that of four or five years ago, but it is essential if we are

to face the continuing challenge of protecting our fragile and perishable natural resources—and ultimately ourselves—from destruction. I hope you will find this manual helpful as we strive to create a society where we can live and work in harmony with the natural world surrounding us.

Russell E. Train
Administrator
U.S. Environmental Protection Agency

PREFACE

Reorganization Plan No. 3 of 1970 transferred 15 governmental units with their functions and legal authority to create the U.S. Environmental Protection Agency. Since only the major laws were cited in the Plan, it was decided that a compilation of EPA legal authority be researched and published.

The publication has the primary function of providing a working document for the Agency itself. Secondarily, it will serve as a research tool for the public.

It is the hope of EPA that this set will assist in the awesome task of developing a better environment.

LANE R. WARD, J.D.
Office of Executive Secretariat
Office of Administrator
U.S. Environmental Protection Agency

INSTRUCTIONS

The goal of this text is to create a useful compilation of the legal authority under which the U.S. Environmental Protection Agency operates. These documents are for the general use of personnel of the EPA in assisting them in attaining the purposes set out by the President in creating the Agency. This work is not intended and should not be used for legal citations or any use other than as reference of a general nature. The author disclaims all responsibility for liabilities growing out of the use of these materials contrary to their intended purpose. Moreover, it should be noted that portions of the Congressional Record from the 93rd Congress were extracted from the "unofficial" daily version and are subject to subsequent modification.

EPA Legal Compilation consists of the Statutes with their legislative history, Executive Orders, Regulations, Guidelines and Reports. To facilitate the usefulness of this composite, the Legal Compilation is divided into the seven following chapters:

A. General
B. Air
C. Water
D. Solid Waste
E. Pesticides
F. Radiation
G. Noise

SUPPLEMENT II

This edition, labelled "Supplement II," contains the additions to and alterations of EPA legal authority not included in the original set or Supplement I of the EPA Legal Compilation. Therefore, this edition updates the Compilation through the 93rd Congress, First Session.

SUBCHAPTERS

Statutes and Legislative History

For convenience, the Statutes are listed throughout the Compilation by a one-point system, i.e., 1.1, 1.2, 1.3, etc., and Legislative History begins wherever a letter follows the one-point system. Thus, any 1.1a, 1.1b, 1.2a, etc., denotes the public laws com-

prising the 1.1, 1.2 statute. Each public law is followed by its legislative history. The legislative history in each case consists of the House Report, Senate Report, Conference Report (where applicable), the Congressional Record beginning with the time the bill was reported from committee.

Example:

1.4 Amortization of Pollution Control Facilities, as amended, 26 U.S.C. §169 (1969).

1.4a Amortization of Pollution Control Facilities, December 30, 1969, P.L. 91–172, §704, 83 Stat. 667.

(1) House Committee on Ways and Means, H.R. REP. No. 91–413 (Part I), 91st Cong., 1st Sess. (1969).

(2) House Committee on Ways and Means, H.R. REP. No. 91–413 (Part II), 91st Cong., 1st Sess. (1969).

(3) Senate Committee on Finance, S. REP. No. 91–552, 91st Cong., 1st Sess. (1969).

(4) Committee of Conference, H.R. REP. No. 91–782, 91st Cong., 1st Sess. (1969).

(5) Congressional Record, Vol. 115 (1969):

(a) Aug. 7: Debated and passed House, pp. 22746, 22774–22775;

(b) Nov. 24, Dec. 5, 8, 9: Debated and passed Senate, pp. 35486, 38321–37322, 37631–37633, 37884–37888;

(c) Dec. 22: Senate agrees to conference report, p. 40718;*

(d) Dec. 22: House debates and agrees to conference report, pp. 40820, 40900.

This example not only demonstrates the pattern followed for legislative history, but indicates the procedure where only one section of a public law appears. You will note that the Congressional Record cited pages are only those pages dealing with the discussion and/or action taken pertinent to the section of law applicable to EPA. In the event there is no discussion of the pertinent section, only action or passage, then the asterisk (*) is used to so indicate, and no text is reprinted in the Compilation. In regard to the situation where only one section of a public law is applicable, then only the parts of the report dealing with that section are printed in the Compilation.

Secondary Statutes

Many statutes make reference to other laws and rather than have this manual serve only for major statutes, these secondary statutes have been included where practical. These secondary statutes are indicated in the table of contents to each chapter by a bracketed cite to the particular section of the major Act which made the reference.

Citations

The United States Code, being the official citation, is used throughout the Statute section of the Compilation. In four Statutes, a parallel table to the Statutes at Large is provided for your convenience.

EXECUTIVE ORDERS

The Executive Orders are listed by a two-point system (2.1, 2.2, etc.).

REGULATIONS

The Regulations are noted by a three-point system (3.1, 3.2, etc.). Included in the Regulations are those not only promulgated by the Environmental Protection Agency, but those under which the Agency has direct contact.

GUIDELINES AND REPORTS

This subchapter is noted by a four-point system (4.1, 4.2, etc.). In this subchapter is found the statutorily required reports of EPA, published guidelines of EPA, selected reports other than EPA's and interdepartmental agreements of note.

UPDATING

Periodically, a supplement will be sent to the interagency distribution and made available through the U.S. Government Printing Office in order to provide a current and accurate working set of EPA Legal Compilation.

CONTENTS

Volume I

WATER

VOLUME II

4.2e STREAM CHANNELIZATION: WHAT FEDERALLY FINANCED DRAGLINES AND BULLDOZERS DO TO OUR NATION'S STREAMS, HOUSE COMMITTEE ON GOVERNMENT OPERATIONS

H.R. REP. No. 93-530, 93rd Cong., 1st Sess. (1973).

STREAM CHANNELIZATION: WHAT FEDERALLY FINANCED DRAGLINES AND BULLDOZERS DO TO OUR NATION'S STREAMS

SEPTEMBER 27, 1973.—Committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

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Mr. HOLIFIELD, from the Committee on Government Operations, submitted the following

FIFTH REPORT

TOGETHER WITH

ADDITIONAL VIEWS

BASED ON A STUDY BY THE CONSERVATION AND NATURAL RESOURCES SUBCOMMITTEE

On September 20, 1973, the Committee on Government Operations approved and adopted a report entitled "Stream Channelization: What Federally Financed Draglines and Bulldozers Do to Our Nation's Streams." The chairman was directed to transmit a copy to the Speaker of the House.

The Committee on Government Operations has for many years examined into the Federal agencies' policies as they relate to water resources development, and public access, recreation, and fish and wildlife developments at reservoirs which the agencies construct or financially aid.[1]

The Committee's Conservation and Natural Resources Subcommittee held extensive hearings on May 3 and 4, June 3, 4, 9, 10, and 14, 1971, and March 20 and 22, 1973, concerning the Federal Government's stream channelization programs, to determine

[1] For example, the Committee's 1957 investigation and hearings on the reservoir policies and practices of the Corps of Engineers and the Bureau of Reclamation resulted in House Report 1185, 85th Congress (Aug. 16, 1957), entitled "Army-Interior Reservoir Land Acquisition Policy." The recommendations in that report resulted in substantial protection and enhancement of fish and wildlife values, and increased public access and recreation opportunities at those reservoirs. The Committee's 1971 hearings and House Report 92-586 (Oct. 21, 1971), entitled "Public Access to Reservoirs to Meet Growing Recreation Demands," made recommendations resulting in increased public access to reservoirs constructed by or with the financial aid of the Federal Government.

whether Federal agencies are responsibly, economically, and efficiently complying with applicable law, including the Fish and Wildlife Coordination Act (16 U.S. Code 661, *et seq.*), the Federal Water Pollution Control Act (33 U.S. Code, 1972 Supp. II, 1151, *et seq.*), and the National Environmental Policy Act of 1969 (42 U.S. Code 4321, *et seq.*), and whether these agencies are adequately assessing the adverse environmental effects of channelization.[2]

At the Subcommittee hearings, testimony was presented by representatives of Federal, State, and local governments, scientists, conservationists, soil conservation district representatives, and others.

INTRODUCTION

For the last three-and-a-half centuries Americans have busily settled, developed and cultivated the continent's flood plains. The rich alluvial soils, surpassed only by those of the tallgrass prairie, were there. The flowing streams were also there, with their promise of easy commerce, communications, water supplies, and waste disposal. Drawn by these advantages, our forebears often built to the river's edge. In this, they were more bold than prudent. Building their homes, factories, farms, and public buildings in the midst of the flood plain, rather than further back on slightly higher ground, virtually invited the natural consequences of the inevitable floods. They stubbornly refused to recognize a flood plain for what it is. From that history came two parallel trends—the accelerating pace of stream "improvements" to control floods, and the even swifter growth of flood damages, such as the great storm "Agnes" caused in June 1972 in the eastern United States.

Typically, each new dam, levee or channelization lures persons further onto the flood plain, secure in the faith that floods won't come rampaging through as often as before. And they don't. But man has never built the dam, levee, or artificial channel that can hold back the heaviest rainwaters, and when they finally breach their concrete or earthen barriers the devastation of the oversettled flood plain is great.

And so, with an ecological indifference our own generation is paying for, earlier Americans devised an engineering approach to the problems of living with floods, flood plains and wetlands. They relied on flood control dams, stream dredgings and drainage ditches. In Delaware, Maryland, and other middle-Atlantic States, extensive drainage networks were dug by slaves. Later,

[2] The hearings are printed in four volumes entitled "Stream Channelization" (92nd Congress, parts 1–4), and 2 volumes similarly entitled (93d Cong., parts 5 and 6).

in the last decades of the 19th century, drainage district were established and thousands of miles of trenches gouged to dry up wetlands. By 1960 over 130 million acres of land had been drained in the United States, mostly by open ditches.[3] These early ditches and others like them across the country were poorly engineered, poorly maintained, and—even worse—poorly designed in relation to their larger watersheds. They "solved" the flood problem by dumping it downstream.

In earlier years, when our population was smaller and had not yet spread so widely over the land, the proliferation of these drainage networks did not reveal their harmful potential. But within the past decade or so, there developed a much more systematic and devastating flood control technology, using large bulldozers and draglines to consummate "channelization" or "stream improvement."

The practice of channelizing rivers and streams consists of deepening, widening, straightening, clearing, or lining their existing channels. Channelization is not itself a water program objective. Rather, it is an engineering measure by the use of which various objectives, or combinations of objectives, may be achieved. These objectives include:

Drainage—the reclamation of wetlands by lowering the level of the water table;

Flood control—through lowering flood stages by increasing the capacity of stream channels;

Navigation—by increasing the natural depth of some of the larger rivers; and

Erosion control—by the substitution of artificial channels for gullies or other eroding natural channels.[4]

Seven years ago a Federal task force of Federal flood control policy noted that despite a Federal investment of over $7 billion in flood control projects since 1936, the Nation's annual flood damage bill has averaged roughly $1 billion annually.[5] Some floods have been catastrophic. For example, in June 1972, the flood which devastated Rapid City, South Dakota, killed over 200 people and caused damages exceeding $1 billion, and Hurricane Agnes, in the eastern United States, killed at least 132 people and caused damage exceeding $1.6 billion. The Council on Environmental Quality estimates that flood losses "now amount to a national

[3] First National Water Assessment, Water Resources Council, 1968.

[4] National Water Commission, "Water Policies for the Future," June 1973, p. 32.

[5] The report, entitled "A Unified National Program for Managing Flood Losses," was issued on August 10, 1966, and was printed as House Document 89-465.

average of almost $2 billion annually." (Fourth Annual Report, p. 313, Sept. 1973.)

The principal programs through which the Federal Government seeks to provide flood protection and relief are: the flood control programs of the Corps of Engineers (hereinafter referred to as the "Corps") which have been authorized by Congress under a series of laws enacted since 1936 called the "Flood Control Acts"; the small watershed program of the Soil Conservation Service (hereinafter referred to as the "SCS"); and the programs of the Tennessee Valley Authority and the Bureau of Reclamation.

There are a number of measures that can be utilized by these agencies to protect people and property from ravaging floods. However, the principal measure used by these agencies is the construction of engineering works or water resource projects such as reservoirs, levees, bypasses, and channelization of streams.

A common thread running through the Subcommittee's hearings, correspondence, and subsequent studies was not that channelization, per se, was evil, but rather that inadequate consideration was being given to the adverse environmental effects of channelization. Indeed, there is considerable evidence that little was known about these effects and, even more disturbing, little was done to ascertain them.

The effects include the draining of wetlands, destruction of hardwood forests, obliteration of oxbows and meanders, lowered water tables, elimination of habitat needed by fish and wildlife, increased erosion and sedimentation, and poor water quality. These effects generally resulted in changing the diversity and productivity of the biota of the waterway, the wetlands and the flood plain.

Thus, the Subcommittee's 1971 hearings clearly disclosed that channelization constitutes major environmental surgery and that the tradeoffs between its costs and benefits vary greatly with the physical setting. While some channelizing cleans out badly aggraded streams or manmade ditches which have little scenic, wildlife, or recreational value, many channelization projects are a traumatic assault against freeflowing water bodies whose natural resources are often irreplaceable.

At the 1971 hearings, the Corps' witness, Major General F. P. Koisch, Director of Civil Works, did not defend channelization per se, but explained that water resource projects, including channelization projects, have traditionally been conceived, evaluated, designed, and constructed "under sound economic principles, and the benefits expected from the project must be more

than the costs." (Such benefit/cost analyses often fail to give sufficient credence to intangibles such as wildlife and scenic values.) He observed, however, "that the American society is moving from a position in which economic development and production are of primary concern, to one in which the quality of life must be considered as well as the material needs." [6] The Committee concurs in this observation, but the 1971 hearings revealed that the Corps and the SCS had not yet developed adequate procedures and policies to implement it.

SCS's Administrator, Kenneth E. Grant, offered a vigorous defense of channelization and, while recognizing some adverse effects, left the Committee with the impression that the SCS considers them to have a limited impact on our environment. He said: [7]

> * * * Channels are used in combination with floodwater-retarding structures and multiple-purpose reservoirs when the topography is suitable. They are included as the last increment in plan formulation. Their use is limited to that required to provide an acceptable level of protection to the adjacent flood plain, recognizing that some short duration inundation can be tolerated on agricultural, forest, and open land.
>
> Channel improvement for flood prevention is used without complementary floodwater-retarding structures in coastal plains, river deltas, and similar areas where topography or other watershed characteristics are not favorable for detention storage.
>
> The need for channel modification is dependent upon the capability of the channel in its present condition to satisfy requirements of the use or uses man wants it to serve. The extent of channel improvement in a watershed is determined by the intensity of development and the planned use of the adjacent flood plain and the magnitude and frequency of flooding expected after other feasible measures have been installed.
>
> The decision to provide a specific level of protection is based on existing investments in the flood plain, its productivity in comparison to available alternative land, and the type of farm enterprise. If the flood plain is in residential or urban development or is used to produce high-value crops such as vegetables, the level of flood

[6] Hearings, part 2, p. 554.
[7] Hearings, part 2, p. 530.

> protection is based on the degree of existing development and investment, availability of alternative development sites for future growth, and impact of lack of development on the community.

He also noted that the SCS is "taking positive and immediate steps to alleviate adverse impacts as much as practicable."

Many other witnesses, however, pointed to the long range adverse effects of channelization as showing the need for a moratorium on its use and a study to discover new ways to prevent or reduce its harm to plants and animals. They noted, for example, that:

Drainage of wetlands profoundly affects plants and animals, not only in areas which support species not found elsewhere, but also by eliminating or reducing both the number and diversity of the species using the wetlands.

Cutting of trees along streambanks eliminates shading and thus exposes streams to the hot sun, with resulting harm to plantlife and heat sensitive aquatic species.

Cutting of bottom land hardwoods, which provide habitat for many birds and animals, eliminates this increasingly scarce habitat and also may increase the nutrients and sediment concentrations in waterways.

Cutoff of oxbows and meanders alters the streambed, destroys diversity of current patterns, increases rate of flow, and removes feeding and breeding grounds for aquatic life.

The National Water Commission's June 1973 report to the President and Congress, entitled "Water Policies for the Future," summarized the consequences of channelization as follows (pp. 32, 34–36): [8]

> It is not channelization in itself that has led to the widespread opposition to the use of this measure but rather its environmental consequences and the downstream effects. Actually, diversion, terrace outlet, and other channels provided as erosion control measures are rarely criticized, as they reduce erosion and, where necessary, are protected by vegetal or artificial linings.
>
> When channelization is undertaken for the purpose of draining wetlands or reducing the frequency of flooding of wooded, brush-covered, or pastured flood plain lands, undeveloped lands are frequently converted to intensively cultivated croplands. This results in the loss of

[8] The seven member Commission was established by Public Law 90–515, approved September 26, 1968, to review and report on present and anticipated national water resource problems. Its report was printed by the Government Printing Office.

both valuable habitat for fish and wildlife and the esthetic values of a natural area.

Another consequence is the acceleration of erosion that results from many channelization projects. Excessive erosion is caused by failure to make proper provisions in the planning of such projects for bank protection and other measures required to stabilize the new channels. The usual reason for omitting these important ancillary measures is to reduce the cost of the channelization project. Since the necessity for reducing costs is most imperative for those projects undertaken to bring new lands into production (because the resulting increase in farm income must exceed project costs) it is normally channelization undertaken to drain wetlands or to decrease the frequency of flood overflow that gives rise to the most serious erosion problems. Had the erosion and sedimentation damages been added to the cost of such projects some of them would have failed to meet the test of economic justification.

Another consequence of channelization is the replacement of meandering natural streams by systems of straight ditches forming a severe and unattractive geometrical pattern. The esthetic value [sic] of the channelized flood plains are further decreased by the removal of trees and other vegetation, by the unsightly appearance of the raw ditch banks, by the muddy torrents that occur during storms, and, in some places, by the failure of the perennial flow that existed under natural conditions. Even in urban areas the installation of artificial channels for flood protection not infrequently meets with criticism because such channels, although more hydraulically efficient, are less pleasing to the eye than the natural channels they replace. In most cases, without expensive maintenance, the new channel will return to its original meandering course.

A further undesirable consequence of channel rectification in headwater valleys is an increase in the frequency and magnitude of downstream floods. This comes about because of the reduction of flood stages in the channelized reach, for any reduction in stage in upstream reaches decreases the temporary storage of flood waters in those reaches and thus increases peak flows in downstream reaches.

This leads also to lowering of ground water levels,

by reducing the time available for infiltration of rain water which is speeded downstream by the artificially improved channels.

* * * * *

Fertile lands can be made available for crop production by drainage improvement and by reducing the frequency of flood overflow through channelization, and in the long run the resulting enhancement in the efficiency of the Nation's agricultural plant may be a desirable consequence. Quite naturally, the owners of wetlands and of rural flood plain lands subject to frequent flooding are desirous of increasing their incomes by utilizing these lands for crop production, and it is nearly always increased farm income that makes possible the favorable ratio of benefits to costs that is necessary to obtain Federal assistance in planning and carrying out channelization projects. In urban areas subject to damage and possible loss of life by floods there is an even more powerful incentive for seeking Federal assistance in increasing the capacity of stream channels. In some areas, drainage projects are desired in order to eliminate mosquitoes and other hazards to public health. The accrual of these and other beneficial effects to landowners and to nearby communities has created interest groups that oppose the efforts of the environmental interests to stop channelization activities.

* * * * *

The evidence placed before the Commission makes it impossible to avoid the conclusion that in many cases insufficient weight has been given to the detrimental consequences of channelization, and particularly to losses not readily expressible in monetary terms. There appears to be a tendency fully to evaluate all benefits that would result from channelization projects, but to underestimate, or even to ignore, some operation and maintenance expenses and damages resulting from lowering of ground water tables, destruction of fish and wildlife habitat, increasing downstream sedimentation and flood damage and loss of esthetic values. The work accomplished during the past few years by the Water Resources Council in its development of principles, standards, and procedures for the evaluation of water projects has made it abundantly clear that in the past such

> evaluations have generally failed to consider all of the consequences of carrying out such projects. It has also made it clear that there are many detrimental effects that must be added to the cost of such projects if a valid benefit to cost comparison is to be made. (Footnotes omitted.)

At the Subcommittee's 1971 hearings, the Assistant Secretary of the Interior for Fish, Wildlife and Parks, Mr. Nathaniel P. Reed, cited many of these effects and then severely criticized channelization. He said: [9]

> Stream channelization projects usually entail changing the physical shape of the streambed and bank, regulating natural streamflow patterns, and impounding or modifying the flood plain. If the emphasis on these practices continues, the ultimate result will be the destruction or serious degradation of valuable and irreplaceable natural resources, including stream fisheries and wildlife in many bottom lands and water courses.
>
> Stream channel alteration under the banner of channel "improvement" for navigation, flood reduction, and agricultural drainage is undoubtedly one of the more, if not the most, destructive water development or management practices from the point of renewable natural resources. These alterations are carried out in varying degrees, with a corresponding variation in damages to stream ecology.
>
> * * * * *
>
> Channelization or other stream alteration practices destroy the balance of space and associated life-supporting elements. The effects of stream alterations on fish and wildlife is somewhat analogous to the impact of hurricane Camille on the human population along the Gulf Coast. After the hurricane—or after stream alterations—the space still remains; however, the elements within the space which support vigorous and thriving populations are no longer immediately available or arranged in a fashion so as to be usable. Fortunately, man has the capability and desire to rebuild his environment following such a disaster. Fish and wildlife lack this rebuilding potential; therefore, the organisms must evacuate the damaged or destroyed habitat or perish.

[9] Hearings, part 2, 394–395.

The 1971 hearings showed that, in utilizing this engineering tool, the Federal agencies were often failing to give adequate consideration to the environmental problems resulting from channelization. They began to recognize this failure and, in 1971, initiated some corrective measures. But many of these were inadequate and some were controversial. In addition, various events occurred after the 1971 hearings which have had a profound impact on the problem. The principal developments were:

(a) *August 1971:* The Soil Conservation Service completed its in-house review of its watersheds projects involving stream channel work, pursuant to its Watersheds Memorandum 108 of February 1971.[10]

(b) *November 1971:* A coalition of environmental groups initiated litigation against the SCS to prevent channelization of 66 miles of Chicod Creek in North Carolina, and on March 15, 1972, the U.S. District Court for the Eastern District of North Carolina enjoined SCS from further work on this project until an environmental impact statement is filed. (*National Resources Defense Council, Inc.,* v. *Grant,* Civil No. 754, 341 F. Supp. 356, 3 ERC 1883.)

(c) *January 18, 1972:* The Interior Department issued its "Policy and Guidelines for the Planning and Review of Stream Channel Alteration Projects".[11]

(d) *March 31, 1972:* A. D. Little, Inc., pursuant to a contract from the Council on Environmental Quality, completed a study on the effects of channelization and issued a draft report which was roundly criticized by CEQ, by numerous citizen organizations, and by Subcommittee Chairman Reuss and Ranking Minority Member Vander Jagt.

(e) *April 6, 1972:* The SCS revised its criteria for preparing environmental impact statements on small watershed projects, pursuant to section 102(2)(C) of the National Environmental Policy Act. However, the SCS indicated that such statements would not be required for projects scheduled for installation with fiscal year 1973 funds which SCS, in its Memorandum 108 review, placed in "Group 1" (projects with "minor or no known adverse" environmental effect, on which work could proceed).

[10] Hearings, part 4, p. 2703.
[11] Hearings, part 5, p. 3279.

(f) *April 28, 1972:* The Bureau of Sport Fisheries and and Wildlife substantially criticized the SCS's review, findings, and conclusions set forth in the SCS report of its Watersheds Memorandum 108 review.[12]

(g) *November 27, 1972:* The General Accounting Office issued a report (B–170186) criticizing the adequacy of environmental impact statements prepared for channelization and other projects.

(h) *December 14, 1972:* The U.S. Court of Appeals for the Eighth Circuit decided, in connection with the Cache River-Bayou DeView channelization project, that the Corps' final impact statement of December 1970 was inadequate and required that the Corps submit a "revised" statement. (*Environmental Defense Fund* v. *Froehlke,* 473 F.2d 346, 4 ERC 1829 (Dec. 14, 1972).)

(i) *December 23, 1972:* The U.S. District Court for the Western District of Tennessee ordered the Corps to prepare a revised environmental impact statement for its channelization project on the Obion and Forked Deer Rivers in Tennessee. (*Akers* v. *Resor,*—F.Supp.—,Civ. No. C–70–349, 4 ERC 1966.)

(j) *December 26, 1972:* The Agriculture Department terminated the Water Bank Act program, despite the fact that the environmental impact statement filed by the Department on May 1, 1972, on initiating the program, had concluded that it will help "reduce the loss of wetlands," "result in preserving habitat" for wildlife, "reduce water runoff, and maintain or build water table levels."

(k) *February 5, 1973:* The U.S. District for the Eastern District of North Carolina enjoined further work on the SCS Chicod Creek project because its environmental impact statement failed to comply with the National Environmental Policy Act. (*National Resources Defense Council* v. *Grant,* 355, F. Supp. 280, 5 ERC 1001.)

(l) *February 12, 1973:* Subcommittee Chairman Reuss urged that Secretary of Agriculture Earl L. Butz rescind the termination of the Water Bank program for failure to file an impact statement when the program was terminated. He cited a ruling of the U.S. Court of Appeals for the Tenth Circuit that an environmental impact statement must be filed when a major program

[12] Hearings, part 5, pp. 3238–3269.

affecting the environment is terminated. (*National Helium Corp.* v. *Morton,* 455 F.2d 650, CA 10, 1971, 3 ERC 1129.)

(m) *February 14, 1973:* The Environmental Protection Agency issued a significant policy statement on wetlands protection.[13]

(n) *March 31, 1973:* A. D. Little, Inc., submitted its final report to the CEQ.

(o) *May 10, 1973:* The Corps of Engineers after nearly 18 months in gestation published its proposed wetlands policy for work in navigable waterways. (38 F.R. 12217.)

(p) Public awareness of the serious environmental problems created by channelization significantly increased as newspapers and periodicals throughout the country reported on the rising storm of public opposition to channelization projects.[14]

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[13] Hearings, part 5, p. 2981. The statement was subsequently published in the Federal Register of May 2, 1973 (38 F.R. 10834).

[14] The following editorial which appeared on January 8, 1972, in the Mooresville, North Carolina, Tribune, is illustrative of this "opposition":

WE PLEAD AN ATTACK OF NOSTALGIA

There is mounting evidence that we were wrong about Ecos and its opposition to the U.S. Soil Conservation Service's channelization practices. Flat wrong.

There is, to start, the well-put letter from Bill Adair in response to our editorial early in May in which we declared we were not joining Ecos in its fight against SCS. We went on to say that our experience in lowland drainage policies of the Soil Conservation Service led us to believe the agency was performing a valuable service.

We have, too, a folder containing a world of material collected by Dick Lowder. The point is made repeatedly in the collected writings that turning natural streams into man-made ditches does more bad than good.

We accept these findings. We stand corrected. From the standpoint of the concerned science teacher, given the view of the fisheries biologist employed by a power company, accepting the gospel according to all converts to the Environmentalist faith, we have no grounds on which to base our support of SCS channelization.

By way of excuse, we must say we were suffering semantical confusion. We felt a nostalgic tugging in references by Ecos to Chicod Creek in Beaufort County. We remember the stagnant ponds, the drowned crops and the hopelessly inadequate field ditches of our youth there. We remember the agricultural godsend of dredging that changed bogs into productive farmland—before the days of soil banks. We recall the liberated look of the dawn-to-dark, hand-to-mouth farmers when the draglines arrived.

The Army's Corps of Engineers and the other Government agencies involved in these drainage programs were hailed as conquering heroes.

Honored likewise in their beginnings were coal-burning locomotives and internal-combustion engines. Billowing smokestacks of factories became magnets for children of those liberated swamp farmers.

Now we have had too much of too many good things. Just as the used-up and decaying inner-city is belching people into the suburbs and beyond, the agricultural order of priorities has reversed. *The aim now is to conserve, not convert the natural purposes of the land.*

The order changeth. We find this altogether fitting. Channelization in 1972 is bad; dredging in 1952 was good. (Italic supplied.)

On March 20 and 22, 1973, the Subcommittee resumed its channelization hearings.[15] The hearings reviewed the corrective actions adopted by these agencies and sought to determine what further improvements in the administration of flood control and related programs were needed to increase the Federal agencies' efficiency and economy and, most importantly, to find ways to prevent, or at least minimize, the adverse environmental effects of channelization.

This report, which is based on the 1971 and 1973 hearings, discusses many of the developments concerning channelization, and attempts to evaluate their effects. It points out several areas where revisions are necessary in statutes and administrative procedures and practices to insure that Federal and federally financed water resource programs involving channelization are carried out economically and efficiently and are environmentally sound. For example, the report describes the failure of the Soil Conservation Service to provide adequate procedures for public participation at an early stage of project planning, despite several provisions in Executive orders calling for such procedures. It criticizes the Bureau of Outdoor Recreation for failing to carry out its statutory duties, and the Bureau of Sport Fisheries and Wildlife for its frequent vacillation—first vigorously opposing, then endorsing, a proposed project, and later, as the winds of public pressure shifted, again opposing it.

The report does not condemn channelization or conclude that it is always bad. Rather, it shows that the tool of channelization has been overused, with inadequate consideration—and sometimes none at all—given to the adverse environmental effects it produces. The Director of the channelization study recently completed by Arthur D. Little, Inc. (hereinafter referred to as "ADL"), stressed this latter point when he testified that: "Engineering solutions strongly reflected local economic motivations and without adequate environmental analysis." [16]

ADL's subcontractor, the Philadelphia Academy of Natural Sciences, emphasized, at the Subcommittee's hearings, the conflict between channelization and the environment in the following statement: [17]

> Channelization of natural streams and the productivity of fish and wetland wildlife ecosystems are unequivocally antithetical. Channelization severely degrades the functional and structural properties of nat-

[15] Footnote 2, *supra*.
[16] Hearings, part 6, p. 3432.
[17] Hearings, part 6, p. 3437.

ural stream and riverine communities by destroying habitat, species diversity, stability, and the production capacity of the systems. Channelization accelerates and makes possible the drainage, conversion and loss of wetland wildlife habitats and the bottomland hardwood forest ecosystems. Channel maintenance, when practiced, arrests recovery of stream and wetland ecosystems. Lack of channel maintenance permits a progressive recovery, but never approaching natural stream productivity or usefulness as an aquatic-wildlife resource.

Channelization accelerates stream sedimentation, nutrient transport and eutrophication processes. The effect of rechannelization of old drainage or flood control channels is to offset recovery and presents opportunity for additional drainage of wetlands. The magnitude of biotic losses due to rechannelization works does not approach levels observed by channelization of natural streams because of the slow in-stream recovery processes. Urban channelization projects rarely are disruptive to natural wildlife communities, but may contribute to degradation of downstream fish and wildlife resources by increasing the peak transport of low quality urban drainage. Observed mitigation efforts, as applied under existing knowledge and enthusiasm, compensates little, if any, to offset or attenuate the direct losses accrued by channelization.

The fears raised by many concerned citizens about the adverse effects of channelization are not imagined or exaggerated. They reflect the real and extensive environmental damage which results from many channelization projects. Unless the Federal agencies act promptly to deal with the problem—by adopting alternatives to channelization, abandoning the channelization features of a project, or substantially minimizing the adverse affects of channelization—those water resource programs will continue to face major citizen opposition and the benefits of these projects to the Nation will be impaired.

CONCLUSIONS

Stream channelization, which consists of deepening, widening, straightening, clearing or lining the existing channels of rivers and streams, is an engineering technique used to control floods, drain wetlands, improve navigation or control erosion. Thousands of miles of the Nation's streams have already been channelized

and many more thousands of miles of channelization are now being constructed or planned.

Some channelization accomplishes good and useful purposes and should be continued. However, other channelization projects either directly or indirectly have adversely affected the environment—ruining fish and wildlife habitat, destroying hardwood forests, damaging scenic and esthetic natural values, lowering water tables, increasing erosion upstream and sedimentation and flooding downstream, impairing water quality, encouraging construction on flood plains and thereby increasing both damages from large floods and demands for more flood protection works, enabling nearby landowners to construct lateral ditches to drain even more wetlands, etc.

The principal Federal agencies engaged in sponsoring channelization are the Corps of Engineers, which constructs dams, levees, bypasses, etc., under the Flood Control Acts, and the Soil Conservation Service, which finances channelization projects principally in connection with small watershed projects under the Watershed Protection and Flood Prevention Act of 1954. These agencies have in many instances not given adequate consideration to the adverse environmental effects of the channelization projects which they have supported. The rapid increase in stream channelization in recent years has aroused much public criticism against the failure of these agencies to consider and prevent environmental harms from such work.

Both the Corps and the SCS have often failed to afford adequate opportunity for full public participation in the development of channelization projects. Although SCS requires at least two public meetings to discuss project proposals, the meetings are held by the project sponsors, not SCS, and no verbatim record is taken for later review by Federal officials and the public. Public notice of the meetings has, at times, been inadequate. Furthermore, SCS has failed to comply with Executive orders issued in 1954 and in 1961, which direct the Secretary of Agriculture to hold public hearings in connection with the small watersheds program, as well as the 1970 Executive order which implements the National Environmental Policy Act of 1969. However, the Corps of Engineers, commendably, issued regulations in January 1973 concerning the holding of recorded public hearings on its civil works program.

Most of SCS's basic guidelines, instructions, memoranda, and other documents which are regulatory in nature or set forth general policy and interpretations for carrying out its small watersheds program have never been published in the Federal

Register, despite the requirements of the Administrative Procedure Act. Similarly, many of the Corps' principal regulations governing civil works projects have not been published in the Federal Register. By failing to publish these regulations and documents, both agencies have hampered public scrutiny of their regulations and policies.

Several large corporations have benefited, or will benefit, from the construction of channelization projects. But these and other beneficiaries often are not identified in the public documents of the Federal agencies doing or financing the channelization work.

Until recently, the SCS collected data from the public on questionnaire forms which were not approved by the Office of Management and Budget as required under the Federal Reports Act. SCS procedures for collecting flood damage data are still ill-defined and result in withholding data from the public in violation of the Freedom of Information Act. Furthermore, the Office of Management and Budget, in approving some SCS questionnaire forms, has allowed SCS to declare some of the data confidential without requiring SCS to show that confidentiality is necessary to carry out the agency's programs and is authorized by law.

The Bureau of Outdoor Recreation has broad statutory authority and duties to review SCS projects in order to conserve and enhance public outdoor recreational opportunities. It has, however, failed to carry out its statutory obligation.

The guidelines issued by the Bureau of Sport Fisheries and Wildlife in January 1972 for the planning and review of channelization projects warned that continuation of channelization will result in serious degradation of valuable and irreplaceable natural resources throughout the Nation. However, the recommendations made by Federal and State fish and wildlife agencies have often been ignored by water resource agencies. Moreover, the Bureau of Sport Fisheries and Wildlife has been unable to exercise its potential influence on channelization projects because of its limited statutory authority and inadequate funding. For example, the Fish and Wildlife Coordination Act requires that the Corps and the Bureau of Reclamation "consult" with the BSF&W, but the Act does not apply to the SCS or TVA. Furthermore, the BSF&W has sometimes been hampered by the failure of its parent agency, the Interior Department, to support recommendations for dropping channelization projects or modifying them to prevent, rather than merely limit, loss of, or damages to, wildlife.

The Environmental Protection Agency maintains that channelization is a major factor in causing the deterioration of water

quality by increasing sedimentation, eutrophication and the accumulation of pollutants such as pesticides. However, the Soil Conservation Service has given little heed to EPA's water quality recommendations. The SCS has generally not adopted either recommendations on water quality, or recommendations on fish and wildlife, unless both the SCS and the local sponsors of watershed projects agree to accept them.

The Federal Water Pollution Control Act of 1972 required that a Presidential order be issued in mid-April 1973 to establish procedures requiring Federal agencies such as SCS to effectuate the purposes of the Act in connection with federally financed projects. The order was not issued until September 10, 1973. Furthermore, although both this Committee and an EPA task force had recommended that the Executive order be made applicable to small watershed projects, the order, which EPA and OMB prepared, will apparently not apply to such projects.

The SCS in 1971 reviewed its pending and new watershed plans involving channelization to determine what changes in workplan or engineering design are needed to further national environmental policies. However, there has been severe public criticism that such review was done without opportunity for participation by the public, and that SCS has refused to accept recommendations for deferral of projects for further study. Furthermore, SCS has not fully complied with the requirements of the National Environmental Policy Act of 1969 that environmental impact statements be prepared for major Federal actions significantly affecting the human environment.

In June 1971, the Council on Environmental Quality contracted with Arthur D. Little, Inc., to conduct an evaluation of the environmental and physical effects of stream channelization, to be completed by October 1971. After several modifications extending the scope of the study and time for completion, as well as tripling the contract price to $195,000, the company's channelization report was completed in March 1973. However, at the request of the Council on Environmental Quality, the report contained no recommendations aimed at preventing or minimizing the adverse effects of channelization.

The Fish and Wildlife Coordination Act provides statutory authority for the concept of mitigation of fish and wildlife losses, i.e., measures to compensate for the loss of and damage to fish and wildlife caused by water resource projects. However, the Corps often has not begun acquisition of mitigation lands concurrently with project construction. Furthermore, the Corps has rejected the view, which is followed by the Bureau of Reclamation, that

the Fish and Wildlife Coordination Act authorizes acquisition of mitigation lands at projects authorized prior to August 1958, such as the Cache River in Arkansas, as well as after that date, and has insisted that a specific statute authorizing the acquisition is necessary. The Corps' dilly-dallying in acquiring mitigation lands has generally resulted in increased costs to the Government for the mitigation land or, worse, the clearing and draining of the lands by private interests which destroy their value for mitigation purposes.

The Starkweather small watershed project in North Dakota, if and when completed, will drain thousands of acres of wetlands. The Bureau of Sport Fisheries and Wildlife at first opposed the project because of its potential destruction of wetlands, then entered into a compromise with the Soil Conservation Service and the local sponsors in order to obtain the approval of the then Governor of North Dakota for the fee acquisition of several thousand acres of wetlands outside the Starkweather area. Later, the Interior Department admitted that the compromise was contrary to the public interest and repudiated it.

It is clear that much improvement is needed in the operations of the Federal agencies discussed in this report. Adoption of the Committee's recommendations will aid in achieving such improvement.

PRINCIPAL RECOMMENDATIONS

(A) The Soil Conservation Service should comply with Executive Orders 10584 of December 1954 and 10913 of January 1961 and promptly adopt new regulations designed to promote public participation in the formulation of its projects. Such regulations should include provisions that recorded public hearings be held, after adequate notice, by SCS on all SCS-financed small watershed projects, whenever there appears to be sufficient public interest, and that, in case of doubt, hearings will be held. (Page 34.)

(B) In accordance with the provisions of the Administrative Procedure Act concerning rulemaking and public information, the Soil Conservation Service should promptly publish in the Federal Register (*a*) all documents which are in fact regulations, although not so designated by the SCS, and (*b*) all other statements of general policy and interpretations of general applicability. (Page 35.)

(C) The Soil Conservation Service, the Corps of Engineers, and

the Bureau of Reclamation should promptly adopt a policy of fully identifying all known project beneficiaries in pertinent project documents which are made available to the public, including environmental impact statements. (Page 38.)

(D) The Soil Conservation Service should promptly include on its questionnaire forms concerning irrigation, drainage, and flood damages a statement which specifies, with respect to commercial and financial data supplied by a respondent, that the respondent shall indicate whether he desires the data to be kept confidential and exempt from disclosure under the Freedom of Information Act (5 U.S.C. 522(b)(4)), and that if he consents to public release thereof he shall indicate his consent in writing. (Page 41.)

(E) The Bureau of Outdoor Recreation should begin immediately to review SCS small watershed projects (*a*) to ascertain their probable effects on recreational and esthetic values, and (*b*) to advise SCS whether, or the conditions under which, SCS should approve such projects. (Page 45.)

(F) The appropriate committee of the House of Representatives should consider amending the Fish and Wildlife Coordination Act to (*a*) extend it to all water resource projects constructed or financed by a Federal agency; (*b*) insure that Federal and State fish and wildlife agencies are notified at an early stage in project development; (*c*) require that Federal water resource agencies set forth their reasons for not including in the project any fish and wildlife mitigation and enhancement features recommended by Federal or State fish and wildlife agencies; and (*d*) require that estimates of fish and wildlife losses not be evaluated solely in monetary terms. (Page 64.)

(G) Executive Order 11738 should be revised to include a specific requirement that the SCS obtain from the appropriate State water pollution control agency, or from EPA, in appropriate cases, a certification that the proposed project will, as a minimum, maintain the chemical, physical, and biological integrity of the affected water. (Page 72.)

(H) The Soil Conservation Service should promptly establish a committee composed of representatives from other Federal agencies, the States, and the public to perform the functions proposed by the SCS Watersheds Memorandum 108 of February 1971 and publish its findings. (Page 83.)

(I) The Soil Conservation Service should promptly abandon Watersheds Memoranda 12 and 121 and adopt a policy of

full compliance with the requirements of section 102(2)(C) of the National Environmental Policy Act of 1969. (Page 95.)

(J) The Council on Environmental Quality should promptly develop and, after providing public opportunity for comment thereon, recommend that the President promulgate, comprehensive guidelines for Federal agencies in planning and carrying out projects involving channelization. These guidelines should require the agencies to show affirmatively that the proposed channelization is in accord with the public interest and that adequate measures to prevent or mitigate environmental damage or destruction are effectively provided for before work on the project is initiated. (Page 108.)

(K) The appropriate committee of the House of Representatives should consider clarifying section 3(c) of the Fish and Wildlife Coordination Act to insure that water resource development agencies can acquire in a timely fashion mitigation lands and interests therein without further authorization by Congress, but subject to obtaining an appropriation for such acquisition. (Page 120.)

(L) The appropriate committee of the House of Representatives should give consideration to repealing the veto provisions of section 3 of Public Law 87-838, as amended (16 U.S.C. 715k-5) or amending them to allow the Governor or the appropriate State agency 30 days to disapprove acquisition of any particular tract of land recommended by the Bureau of Sport Fisheries and Wildlife. (Page 124.)

TEXT OF REPORT

I. THE PRINCIPAL FEDERAL AGENCIES WHICH ALTER AND MODIFY AMERICA'S WATERWAYS FOR FLOOD CONTROL AND DRAINAGE PURPOSES ARE THE CORPS OF ENGINEERS AND THE SOIL CONSERVATION SERVICE [18]

A. THE CORPS OF ENGINEERS

Of all the Federal agencies authorized to engage in channelization, the Corps of Engineers has the oldest mandate to modify the natural behavior of America's rivers and streams. It began

[18] The Bureau of Reclamation and the Tennessee Valley Authority also are authorized to build water resource projects for flood control and other purposes and have, in the past, utilized channelization to achieve these purposes.

work on navigation improvements in 1824. In 1850, Congress authorized a survey of the Mississippi River to include investigations to develop the most practical plan for assuring flood control in the Mississippi River Valley.

The Corps' present channelization authority derives chiefly from the Flood Control Act of 1936 (49 Stat. 1570). It was the first of a series of laws known collectively as the "Flood Control Acts." The 1936 law established for the first time a national flood control policy. A key part of this policy was the statutory directive that "the Federal Government should improve or participate" in improving our waterways, "including watersheds * * *, for flood control purposes if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people are otherwise adversely affected." The Flood Control Act of 1944 (58 Stat. 887) modified the earlier law by redefining flood control to include "major drainage." The Corps' former Director of Civil Works, Major General F. P. Koisch, testified at the Committee's June 1971 hearings [19] that, like "flood control in rural areas, major drainage works modify hydrologic and ecological systems for economic gains."

Channelization is one of the tools used by the Corps in implementing this national flood control policy.

The planning, design, authorization and construction of Corps projects often stretch over long periods of time. Some projects which were authorized in the 1950's or '60's or even earlier have never been funded or only recently reached the construction stage. Many of them include channelization features. Some are even ancient. For example, in 1881, the Congress authorized the Corps to widen, deepen and straighten Neabsco Creek in Virginia, and appropriated $5,000 for this purpose. The project remained quite dormant for over 80 years, until 1964, when it was reactivated at the urging of a few persons who would be its principal beneficiaries. One factor which tends to bring these old projects out of limbo is that the Corps follows the practice of computing the project benefit-cost ratio with the interest rate which was in effect when the Congress first apropriated funds for the project.[20] Many of the old projects would not produce a 1:1 benefit-cost ratio if the current higher interest rate were used.

B. THE SOIL CONSERVATION SERVICE

The principal builder of channelization projects in the South-

[19] Hearings, part 2, p. 554.
[20] Hearings, part 2, p. 582.

eastern and Midwestern United States is the Soil Conservation Service (SCS). This agency was established as the Soil Erosion Service within the Interior Department in 1933 and was transferred to the Department of Agriculture in 1935,[21] after the worst duststorm in the Nation's history. The "Dust Bowl'" States had generated a great billowing brown cloud that rolled eastward from the Great Plains to the Atlantic Coast in May 1934, scouring the croplands in its path. It was largely a manmade disaster. Foolish and greedy cropping and grazing practices had destroyed the cover that rooted the rich topsoil of the plains; windstorms confiscated the exposed humus grain by grain; and the big blow of 1934 nearly finished the job.

The young SCS won the Nation's admiration in the 1930's and 1940's. Working through local soil and water conservation districts (now over 3,000 in number, with more than 3.2 million members),[22] the SCS tried to "hold the raindrop where it falls" in land properly tilled, cropped or returned to forests and grass. It weaned thousands of farmers from the superficially profitable, but eventually ruinous, agriculture they had been accustomed to follow. Through technical aid, demonstration plots, and cost-sharing, the SCS—to its great credit—promoted the use of cover crops, terraces, contour farming, crop rotation, fish ponds, reforestation, tile drainage, grassed waterways and other land-saving measures. These reforms not only restored the agriculture of the plains, they also enriched the habitats of many wildlife species and reduced the silting of upland streams. At no time since have the priorities of farmers and environmentalists been so congenially matched.

The Act of April 27, 1935, established the SCS to carry out the "policy of Congress to provide permanently for the control and prevention of soil erosion and thereby to preserve natural resources, control floods, prevent impairment of reservoirs and maintain the navigability of rivers and harbors, protect public health, public lands and to relieve unemployment." (Public Law 74–46, as amended (16 U.S.C. 590 a–f)). It authorized the Secretary of Agriculture (1) to conduct surveys and investigations; (2) to carry out "preventive measures, including, but not limited to, engineering operations, methods of cultivation, the growing of vegetation, and changes in use of land"; (3) to "furnish financial or other aid to any agency, governmental or otherwise, or any person, subject to such conditions as he may deem necessary, for the purposes of" the Act, and (4) to acquire lands "whenever necessary for the purposes" of the Act. Although this statutory

[21] Act of April 27, 1935 (16 U.S.C. 590a–f).
[22] Hearings, part 3, p. 1357.

language appears broad enough to enable SCS to provide aid for dredging and modification of steams, SCS does not generally rely on this statute for such purpose at present.

Title III of the Bankhead-Jones Farm Tenant Act of July 22, 1937, as amended (7 U.S.C. 1010), authorized and directed the Secretary:

> * * * to develop a program of land conservation and land utilization, in order thereby to correct maladjustments in land use, and thus assist in controlling soil erosion, reforestation, preserving natural resources, protecting fish and wildlife, developing and protecting recreational facilities, mitigating floods, preventing impairment of dams and reservoirs, conserving surface and subsurface moisture, protecting the watersheds of navigable streams, and protecting the public lands, health, safety, and welfare, but not to build industrial parks or establish private industrial or commercial enterprises.

Through fiscal year 1969, SCS had provided technical and financial assistance under this law to local public organizations for 698 miles of dredging, modification, and channelization of rivers and streams.

The Act of April 27, 1935 (16 U.S.C. 590g(a)), requires SCS, among other things, to preserve and improve soil fertility, promote the economic use and conservation of land, and protect rivers and harbors against the results of soil erosion in aid of flood control and navigation.

Section 13 of the Flood Control Act of 1944 (Public Law 78–534) authorizes the Secretary of Agriculture to prosecute works of improvement for runoff and waterflow retardation and soil prevention in 11 watersheds.[23] Through fiscal year 1969, SCS had provided technical and financial assistance under these laws for work on 876 miles of streams.

The Act of August 7, 1956, as amended in 1969,[24] authorizes SCS "* * * to enter into contracts * * * with owners and operators of land in the Great Plains area * * * to assist farm, ranch, or other landowners or operators to make, in orderly progression over a period of years, changes in their cropping systems or land uses which the needed to conserve, develop, protect,

[23] The 11 watersheds are: Los Angeles River Basin; Santa Ynez River Watershed; Trinity River Basin (Tex.); Little Tallahatchie River Watershed; Yazoo River Watershed; Coosa River Watershed (above Rome, Georgia); Little Sioux River Watershed; Potomac River Watershed; Buffalo Creek Watershed (N.Y.); Colorado River Watershed (Tex.); and Washita River Watershed.

[24] Public Law 84–1021, as amended Nov. 18, 1969, by Public Law 91–118, 83 Stat. 194; 16 U.S.C. 590p.

and utilize the soil and water resources of their farms, ranches, and other lands and to install the soil and water conservation measures and carry out the practices needed under such changed systems and uses." Through fiscal year 1970, SCS had provided technical and financial assistance under this law to land users in the Great Plains area for dredging, modification, and channelization on 600 miles of rivers and streams.

But most of the assistance now provided by SCS to local sponsors is carried out under the 1954 Watershed Protection and Flood Prevention Act, popularly referred to as "Public Law 566" of the 83rd Congress (16 U.S.C. 1001, *et seq.*). Section 1 of the Act states:

> Erosion, floodwater, and sediment damages in the water sheds of the rivers and streams of the United States, causing loss of life and damage to property, constitute a menace to the national welfare, and it is the sense of Congress that the Federal Government should cooperate with States and their political subdivisions, soil or water conservation districts, flood prevention or control districts, and other local public agencies for the purpose of preventing such damages and of furthering the conservation, development, utilization, and disposal of water and thereby of preserving and protecting the Nation's land and water resources.

Applications for aid under this Act are first submitted by a local sponsoring organization to the Governor, or to a State agency designated by the Governor to act on applications. If the application is "not disapproved within 45 days" by the Governor or the State agency, the SCS "is authorized" to conduct necessary "investigation and surveys"; prepare work plans; make cost allocations to various project purposes and determine "whether benefits exceed costs"; "enter into agreements" to provide financial and technical assistance; and obtain assistance from other Federal agencies. 16 U.S.C. 1003.

Although the statute appears to indicate that the Governor's or State agency's, silence on the application for 45 days is equivalent to approval, the SCS's Watershed Protection Handbook (WPH) specifies in section 101.012-a that the application "must" be "submitted and approved" by the Governor or the designated State Agency. However, according to SCS's September 1971 listing of designated State agencies,[25] in only one State—Missouri—does the Governor act upon these applications. In about 12 States,

[25] Hearings, part 5, p. 2914.

the designated State agency is the State soil and water conservation committee. The witness for the Natural Resources Defense Council, Mr. Thomas J. Barlow, testified that these committees are almost wholly composed of representatives of argicultural interests. He said: [26]

> In North Carolina, the seven commission members are all officers of local conservations districts. In Louisiana the commission is composed of officers of local conservation districts, a professor of agriculture from Louisiana State University, and the commissioner of the Department of Agriculture. In Maryland all members are representatives of the agricultural industry with the exception of the State's Water Resources Administrator. The pattern of almost total dominance of these commissions' memberships by representatives of conservation districts and the agricultural industry is duplicated in every State.

In a July 13, 1973, letter to the Subcommittee, Administrator Grant noted that these committees "also recommend the order of priority for planning projects. * * *"

The 1954 Act permits applications for financial assistance work in watersheds or subwatershed areas not exceeding 250,000 acreas, with no single structure which provides more than 12,500 acre-feet of floodwater detention capacity or more than 25,000 acre-feet of total capacity. If the estimated Federal contribution under the Act to construction costs would exceed $250,000, or any single structure would provide more than 2,500 acre-feet of total capacity, the work plan must be approved by the appropriate committees of Congress.[27] Other project plans may be approved by the SCS without approval of a congressional committee.

The SCS has had a longstanding policy against providing Federal cost sharing under any of its programs for the primary purpose of bringing new land into cultivation,[28] or drainage to

[26] Hearings, part 6, p. 3359.

[27] The Senate Agriculture and Forestry Committee and the House Agriculture Committee approve plans with a single structure providing not more than 4,000 acre-feet of total capacity. The Senate and House Public Works Committees approve plans with a single structure providing more than 4,000 acre-feet of total capacity. (16 U.S.C. 1002.)

[28] See SCS's Watershed Protection Handbook (WPH) 101.012(n). The Corps, on the other hand, has testified that it "has to date not withheld favorable recommendations on projects simply because they might bring new lands into agricultural production." Indeed, the National Water Commission estimates that Corps' works "already completed or now under construction would allow 6.3 million acres of land not presently cultivated to be added to the agricultural land base when it is cleared," and that an additional 29.6 million acres are already "cleared and suitable for agriculture" (footnote 2, *supra*, p. 123). But the Corps is "reviewing" the question. (Hearings, part 5, p. 2894.) On September 4, 1973, the Subcommittee asked the Corps for a status report concerning that review.

facilitate major land use changes.[29] Channelization for this purpose is not permitted. However, this does not prevent the local sponsors or landowners from installing such drainage and fully financing the costs thereof. According to a discussion paper recently prepared by the Agriculture Department's representative on an Interdepartmental Task Force for Cost Sharing—established in July 1973 "to develop viable alternatives to the National Water Commission * * * cost sharing objectives"—landowners "usually are able and willing to bear all costs for on-farm drainage measures." However, stream channelization often facilitates the installation of such drainage facilities. Thus, channelization enables the local sponsors or landowners to achieve the same result despite the SCS policy and statutory prohibitions against use of Federal funds for drainage of wetlands.

Typically, a P.L. 566 project begins when a local watershed group (most often a water management, drainage, or soil and water conservation district) submits a written request, through the State, asking the SCS for help. If forthcoming, this help will include an early feasibility study, cooperation in drafting a watershed "work plan" and calculating a benefit-cost ratio, the drafting of an environmental impact statement, Federal funds (up to 100 percent for channelizations), and liaison with other State and Federal agencies and Congress.[30] To be eligible for assistance, local sponsors must acquire necessary land and water rights, and provide satisfactory evidence that they will operate and maintain improvements. After the request is cleared by the Governor or the designated State agency, the momentum of a small watershed project is sustained exclusively by the SCS and the local sponsors.

Mr. George R. Bagley, National Vice President of the National Association of Conservation Districts, testified at the Committee's

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[29] Since fiscal year 1963 the annual Department of Agriculture Appropriation Act has contained a proviso (commonly known as the "Reuss Amendment") to the paragraph appropriating funds for the Department's Agricultural Conservation Program. That proviso was first incorporated in the Agriculture Department Appropriation Act of Oct. 24, 1962 (P.L. 87-879, 76 Stat. 1210), as follows:

> Provided further, That no portion of the funds for the 1963 program may be utilized to provide financial or technical assistance for drainage on wetlands now designated as Wetland Types 3(III), 4(IV), and 5(V) in United States Department of the Interior, Fish and Wildlife Service Circular 39, Wetlands of the United States, 1956.

Section 106.041 of the SCS Watershed Protection Handbook states:

> The Reuss Amendment applies only to the Agricultural Conservation Service program, a program described in the Soil Conservation and Domestic Allotment Act, 16 U.S.C. 590g–590(o), 590p(a) and 590p(q). However, the SCS has taken the position that it will not provide funds under the Small Watershed program (P.L. 566, 83d Cong.—Watershed Protection and Flood Prevention Act) for drainage of wetland Types 3, 4, and 5.

[30] See SCS flow chart, hearings, part 2, p. 1254.

June 1971 hearings that when Public Law 566 was being considered in Congress in 1954 "district leaders insisted that the watershed program be a local program with Federal assistance." He further testified: [31]

> From the very beginning, NACD has supported and worked for amendments to the original act to extend and improve its usefulness and broaden its purposes. *These amendments approved by the Congress have transformed the program from one of primarily flood prevention to a multiple-purpose program of much greater breadth, providing for development of water supplies for towns and cities, industries, fish and wildlife enhancement, recreation, and agricultural use.* (Italic supplied.)

The extent to which these projects are in fact "multi-purpose" is clouded by two factors:

First, the SCS Watersheds Memorandum No. 86 of September 28, 1967 emphasizes that "the Soil Conservation Service will not authorize for planning any watershed in which flood prevention is not the primary project purpose and for which approval by the Agriculture Committees of the Congress is required." The memorandum further states that the primary purpose "will be determined on the basis of relative costs rather than of benefit accrual." Memorandum 86 was issued to comply with the letter which the Chairman of the House Committee on Agriculture sent on July 31, 1967 to then Speaker John W. McCormack. The letter is quoted in Watersheds Memorandum No. 86. In approving two projects that were "primarily" for irrigation purposes, the committee said:

> * * * the committee takes this occasion to make its position perfectly clear on projects whose primary purpose is not flood prevention.
>
> As it has in the past, the committee will welcome incidental benefits such as recreation, irrigation, and municipal water supply which are consistent with good soil and water management; however, such benefits must be secondary to flood prevention.
>
> The Watershed Protection and Flood Prevention Act has been a flood prevention program and a highly successful one. To try to expand it into other vast areas such as irrigation which are better served by other programs, in the opinion of the committee, would only serve to diminish its effectiveness.

[31] Hearings, part 3, p. 1358.

> The Committee respectfully urges the Department of Agriculture to carefully consider this policy in order that no further projects whose primary pupose is not flood prevention will be submitted to the committee.

SCS's 1967 memorandum does not apply to plans or projects approved by the House and Senate Public Works Committees or by SCS without any congressional committee approval.

Second, the SCS, in section 101.011 of the Watersheds Protection Handbook (WPH), states that: "All watershed projects should have multiple purposes." But the decision as to whether it will or will not be a multiple purpose project is made, not by the SCS, but by the local sponsors, who will often be particularly concerned about the cost of a multi-purpose project versus a single purpose project. The handbook states:

> *If the local organization desires to proceed* with flood prevention improvements *without* planning justified irrigation, drainage, recreation, fish and wildlife, or other water management facilities, *the work plan may be prepared on this basis.* Likewise, justified measures for flood prevention over and above those required to provide an acceptable level of protection *may be omitted*, provided their omission does not increase or adversely affect the cost of installation, operation, and maintenance of irrigation, drainage, recreation, fish and wildlife, or other water management facilities. If, however, local organizations seek assistance for works of improvement serving single purposes, and which could more appropriately be carried out under other Federal programs, they should be advised of such programs, and encouraged to seek assistance under them. (Italic supplied.)

The watershed projects approved by the SCS since July 1, 1960, involve the channelization of some 16,400 miles of waterways at a total Federal cost of about $360 million as of May 1, 1971.[32] Of this total, about 4,200 miles had been channelized. More than 1,000 miles of channelization projects have been approved in Arkansas, Louisiana, and Texas alone. In Mississippi, the total exceeds 3,100 miles. In addition, the SCS had numerous applications for watershed projects involving many miles of channelization work pending as of May 1, 1971.[33]

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[32] Hearings, part 3, p. 1624.

[33] For a listing in each State of all approved, and applications for, watershed projects involving channelization, see hearings, part 3, app. 15, table A (p. 1625) and table B (p. 1750).

In the fall of 1972 the SCS completed an inventory of all channel modification work planned and carried out under its various authorities. This inventory shows that the total number of miles of channel work planned in projects approved for operations through March 31, 1972, had increased to 21,106 miles, and that, of this amount, 7,729 miles have been constructed. The SCS said that its inventory or classification revealed that a little more than "3,200 miles of natural perennnial-flowing streams, or about 15 percent of the total channel work planned, would fall in the category of 'channelization'." The SCS emphasized that: [34]

> More than two-thirds of all channel work, planned or installed, is on channels having intermittent flow (approximately 7,100 miles) or that flow only during periods of surface runoff (also about 7,100 miles).

Assistant Secretary of the Interior Nathaniel Reed criticized the inference which the SCS seems to draw from this inventory, namely, that environmentalists should not fret over channelization because the SCS is merely re-working already channelized waterways in most instances. Mr. Reed testified: [35]

> I have been on an old channelized stream, sections of which have totally recovered and which have regrown in a number of different States. The areas that the SCS has inventoried contains some of those areas. They contain other areas of natural drainage leading into other areas, which they wish to modify. I cannot say that it is 100 percent previously manmade. There are a lot of natural areas involved in this, case-by-case.

The witness for the Natural Resources Defense Council, Mr. Thomas Barlow, also pointed out in his statement: [36]

> * * * This SCS classification system has serious defects:
>
> (1) Ditching work on much of the stream mileage classified as previously channeled was of such minor consequence and was performed so long ago that the streams have recovered their natural vitality. Most of this channelization did not involve the heavy engineering techniques now employed by the SCS.
>
> (2) Many of the streams classified as intermittent or

[34] Hearings, part 5, p. 2915.
[35] Hearings, part 5, p. 2946.
[36] Hearings, part 6, p. 3353–3354.

ephemeral are adjacent to wetlands and swamps and, if channeled, would drain the nourishing waters from these areas.

(3) The classification system does not touch on the land use changes which channelization encourages and which can impair imporlant natural resource areas.

(4) The classification system does not shed any light on other natural resource categories directly affected by channelization such as down stream water quality. "Intermittent" and "ephemeral" streams can be a critical part of the overall watershed ecosystem.

(5) Finally, this SCS classification of streams scheduled for SCS channelization in States was made by the SCS without consulting State natural resource agencies.

II. WITH THE INCREASED USE OF CHANNELIZATION AS A MEANS OF CONTROLLING FLOODS SINCE THE LATE 1950'S, THERE HAS BEEN A CORRESPONDING INCREASE OF PUBLIC CRITICISM AGAINST THIS ENGINEERING TOOL

The ecological consequences of channelization flow from its massive restructuring of the streambed and adjacent banks for flood control purposes.

Most waterways flow in a meandering, but definite, channel with oxbows, vegetation and sloping banks. On one or both sides of the channel lies the flood plain. Channelization generally involves the reshaping of the waterway bed and its banks to provide a greater flow capacity than that of the natural channel. Bulldozers, dragline buckets and dredge bits gouge the stream deeper and straighter, lopping off its meanders, obliterating its pools and riffles, and cutting its banks at a uniform and sharp angle. Logs, brush and other types of debris are cleared away, and the immediate flood plain on either side of the channel is stripped of vegetation—often in a swath more than 200 feet wide. Dredge spoil is sometimes heaped along the bank to make the channel even deeper.

The channel bottom is usually cut to a uniform depth and width, eliminating most ecological niches. Streamflow loses its fast-slow character (ideal for oxygenation) and temporarily evens out—though the long range result may be a channel that trickles in dry weather and rampages during storms. Along great stretches, the new channel runs ramrod-straight. Its banks look

cleanly shaved, deprived of their reeds, roots and overhanging branches.[37]

To provide effective flood control through built-up, highly developed areas, such as urban or residential areas, channels must have adequate capacity to carry within-bank the peak discharges expected from the contributing areas for a predetermined frequency, usually 100-year (1 percent chance). Overbank flows are not to be tolerated.

To provide an acceptable level of flood protection to agricultural areas, it is not necessary for channels to carry all flows within banks. The functions of channels in these areas are threefold: (a) to reduce the frequency of over-bank flows, such as from an average of 4 times per year to once every 2 or 3 years depending on the value of the crops involved; (b) to reduce the depth of inundation; and (c) to reduce the duration of inundation, such as from 5 days to 2 days.

The destructive effects of this radical reshaping of a waterway are often manifold.

Many citizens and environmental organizations have become more and more concerned about these effects, and more and more critical of the increasing use of channelization by Federal agencies in recent years. So important an issue has this practice become that the National Audubon Society listed the "correction of channelization policies" among its highest "action priorities." [38]

Major General Maxwell E. Rich (ret.), Executive Vice President of the National Rifle Association, acknowledged that some channelization projects have "enhanced environmental quality," but he emphasized: [39]

> Too often, however, these federally subsidized programs have subverted the wise and basic principles of conservation and have, in the opinion of many competent biologists, done irreparable harm to soil and water and wildlife resources.
>
> * * * * *
>
> Case histories of dredging, drainage and channelization are legion and each such history has in common

[37] For a picture of an improved channel that is straight and cleanly shaved, see SCS Picture No. 6 of Cowpen Slough in Florida printed at p. 52 of the Senate Committee on Public Works' hearings of July 27, 1971, entitled "The Effect of Channelization on the Environment" (hereinafter referred to as "Sen. Hearings").

[38] Hearings, part 1, p. 9.

[39] Hearings part 1, p. 146.

with others the conversion of living streams to silted ditches.

* * * * *

Many of these federally sponsored projects lay claim to providing additional man-days of recreation on the water impoundments and reservoirs thus created. However, we hear no claims being made as to the quality of this new recreation. Nor do we hear much about increased siltation rates of water impoundments because of channelization of upstream tributaries.

We suspect that frequently the deciding factor on channelization, reclamation, and so-called flood control projects is an economic one. The implication of increased short-time prosperity brought about by the expenditure of substantial sums of money by the Federal Government for local construction overrides the long range loss suffered from a degraded environment.

Mr. George R. Bagley, Vice President of the National Association of Conservation Districts, acknowledged that many conservation districts "recognize the problems inherent in the use of channel modification for flood prevention in watershed projects." [40]

Frustrated with the inadequacy of environmental evaluations of channelization projects by Federal agencies, citizens increasingly turned to the courts and sought and obtained injunctions against continued work on several major projects.

On December 14, 1972, the U.S. Court of Appeals for the Eighth Circuit ruled that the Corps of Engineers' environmental impact statement of December 1970 concerning the Cache River-Bayou DeView channelization project was "vague, too general and too conclusionary." The Court said that Federal Courts "have an obligation to review substantive agency decisions on the merits to determine if they are in accord with NEPA." This review "is a limited one for the purpose of determining whether the agency reached its decision after a full, good faith consideration of environmental factors made" under NEPA standards and "whether the actual balance of costs and benefits struck by the agency according to these standards was arbitrary or clearly gave insufficient weight to environmental factors." The Court therefore remanded the case to the District Court to require the Corps to submit a "revised" statement and to review the Corps' decision to proceed with the project.[41]

[40] Hearings, part 5, p. 2972.

[41] *Environmental Defense Fund* v. *Frochlke*, 4 ERC 1829, 473 F. 2d 346.

Another major case involved the Corps' channelization of about 110 miles of the Obion River system and 106 miles of the Forked Deer River system in Tennessee, a largely rural area.[42] The suit was instituted in the U.S. District Court in Tennessee after about 69 miles of stream had been channelized. The Corps' General Koisch described this project as "a classical example of the conflict in competing use of resources"—enhancing "the human environment" by providing "increased crop yields; reduced flood inconveniences, health hazards, and dangers; and encouragement of a generally higher standard of living"—but accelerating "the clearing for agriculture" of about "84,000 acres * * * of woodlands and prime wildlife habitat." General Koisch noted that "when these concerns became apparent," the Corps restudied the project and issued a mitigation report (i.e. a report on measures to compensate for, but not replace, loss of and damage to fish and wildlife resources), but it "was roundly criticized by all sides." [43]

Mr. Harold Warvel, Assistant Director of the Tennessee Game and Fish Commission, predicted that completion of the Obion-Forked Deer "channel project will, in time, eliminate fish and wildlife resources by drainage and woodland conversion." He noted that extensive lateral drainage systems are "already" being installed, and that although the original plans stated that woodlands subject to flooding "1 year or more in 3, would not be cleared," they are being "cleared and the area devoted to agriculture." He said: [44]

> Flood damages in 1948 were $55,000; in 1965 $757,000; and in 1970, $2 million. It would appear that as land is cleared and devoted to high value cash crops the periodic anticipated—and I underscore that word—anticipated floods result in higher damages, thereby justifying additional flood control.

Mr. Warvel noted that similar problems are found in the SCS's small watershed program, as follows: [45]

> Our problems associated with the small watershed program under Public Law 566 are basically the same. They involve channelization and subsequent drainage and clearing of adjacent bottom land hard wood. While the channeling destroys the fishery habitat, the loss of wildlife habitat that occurs following drainage of areas

[42] *Akers* v. *Resor*, 4 ERC 1966, — F. Supp. — (Dec. 23, 1972).
[43] Hearings, part 2, p. 555.
[44] Hearings, part 3, p. 1286.
[45] Hearings, part 3, pp. 1286, 1287.

> adjacent to the streams is important when considered from an accumulative point of view. This is where we get nibbled to pieces. Each project has a little, and it is pretty hard to argue too much with the local people that this wildlife habitat is really important when they are dealing with flooding in some buildings that shouldn't have been built in the flood plains in the first place.
>
> Although we have good working relations with the Soil Conservation Service, we still end up with streams channeled and lands drained and cleared. In the past, planning under Public Law 566 has been carried out with emphasis on engineering rather than consideration for ecological principles or environmental values. Although this is still the case, SCS engineers in Tennessee are more aware of our interest and have tried to incorporate some mitigating measures where possible. Even so, when mitigation measures are recommended there has been no assurance that the watershed district would decide to include these measures and to follow through with implementation and maintenance.

The Federal District Court's decision enjoined further channelization of the Obion-Forked Deer project because the Corps' environmental impact statement "has not complied" with the procedural requirements of NEPA in that it (a) lacked adequate discussion of project alternatives such as flood plain planning and zoning, flood plain insurance, upstream structures, or deferring channelization work until "after" mitigation land is acquired; (b) failed to reflect the views of the Agriculture Department as to the effect of channelization on land use and the views of the State Highway Department as to project maintenance costs; and (c) "deals only peremptorily with the accepted importance" of wetlands in the project area "to the Mississippi flyway, to the production of water fowl, to the water quality in these streams and to other unquantifiable values."

Still another major case in which citizen groups obtained an injunction involved the SCS's Chicod Creek watershed project channelizing 66 miles of streams in Pitt and Beaufort Counties in North Carolina. The Court's opinion concerning the inadequacies of the SCS's final environmental impact statement reads like a litany about administrative incompetence, myopia, anti-

environmental bias and lack of candor. The SCS statement, the Court said: [46]

> 1. "misrepresents the adverse environmental effects of the project upon fish habitat" caused by "a massive increase in sedimentation from the project";
> 2. "misrepresents the effect of the project upon fish resources";
> 3. "ignores the effect of the project on potential eutrophication problems in the Tar-Pamlico estuary";
> 4. "fails to disclose the maintenance history of P.L. 566 projects";
> 5. "ignores the serious environmental consequencies of the proposed use" of the kudzu vine along 23.5 miles of new channels;
> 6. "misrepresents and fails to disclose" that "over 17% of the acreage to be benefited by the project is held by the Weyerhaeuser Company, a large lumber company";
> 7. fails to "contain an adequate discussion of the possible adverse effects of the project upon downstream flooding";
> 8. fails to "disclose or discuss the cumulative effects of the project"; and
> 9. fails to "fully disclose or adequately discuss alternatives to the project".

The Chairman of the Council on Environmental Quality, Mr. Russell E. Train, quite nicely summed up the impact of these decisions and citizen concern at the Subcommittee's March 1973 hearings, while also emphasizing that not all channelization is bad. He testified: [47]

> Mr. FOUNTAIN. * * * Your statement in no way is designed to leave the impression that all channelization is bad, is it?
>
> Mr. TRAIN. No, sir. * * * I think that our major concern, particularly in the case of the Soil Conservation Service, is simply that the analysis of environmental impact is really quite fragmentary and does not really give an adequate basis for public consideration of the project. It is not that the projects necessarily are bad. Some are bad, no question about it; and as the SCS itself has stated, and probably will again, they have themselves,

[46] *Natural Resources Defense Council* v. *Grant*, 5 ERC 1001, 355 F. Supp. 280 (Feb. 5, 1973).

[47] Hearings, part 5, pp. 2878–2879.

> abandoned a number of projects in part for environmental reasons over the years. But, I think, that as the court in *Chicod Creek* watershed case pointed out very forcefully, the environmental statement in that particular case stated conclusions largely without any supporting data, and ignored a number of other important considerations such as eutrophication, which is admittedly an important problem in that area of the country in the coastal areas of North Carolina. And these are our concerns.

III. THE SOIL CONSERVATION SERVICE AND THE CORPS OF ENGINEERS HAVE NOT ALWAYS AFFORDED THE PUBLIC ADEQUATE OPPORTUNITIES TO PARTICIPATE MEANINGFULLY IN THE DEVELOPMENT OF MANY CHANNELIZATION PROJECTS

The Committee's hearings show that one of the principal reasons why channelization has become anathema to so many citizens and groups is that the entire process of promoting small watershed channelization projects—from the local request for Federal assistance to the construction and maintenance of a cleared streambed—takes place with little regard for the broad public interest, particularly the nonagriculture-oriented interests such as the wildlife or the environmental constituencies. Witness after witness asserted that the voice of the public is often shut out and, even when heard, is seldom heeded.

On the one hand, those supporting SCS's channelization work portray the small watershed program as an example of grassroots democracy. Thus, Mr. George R. Bagley, Vice President of the National Association of Conservation Districts, said: [48]

> It is truly a grassroots program—a plea from local property owners, urban and rural alike, for planned water management and protection from the ravages of floods. Soil and water conservation districts are the principal sponsors of each of the 1,000 watershed projects that have been approved to date * * *.

From the officers of the Board of Commissioners, Roads and Revenues in Mitchell County, Ga., the Committee received this statement: [49]

> Basically, Soil Conservation Projects including channelization, irrigation, multi-purpose and flood retarding structures, improvements of wildlife habitat and

[48] Hearings, part 3, p. 1358.
[49] Hearings, part 3, p. 1887.

> other ecological and environmental projects are *initiated by the local people* living in any given area based on their ownership of the land, their knowledge of its assets as well as its shortcomings, and furthermore these people in most cases depend upon that land for their livelihood. Also theirs is not generally a month's accumulation of facts and recorded needs but in most cases years and years and generations of ownership. (Italic in original.)

And, in testimony before the Committee in June, 1971, this noteworthy comment by SCS Administrator Kenneth Grant: [50]

> * * * the small watershed program provides a process for investigating, evaluating and discussing all of the considerations. It provides a forum for all interest groups within a watershed. It provides for careful review by many government agencies at the local, State and Federal level.

On the other hand, critics of the SCS's channelization program note that channelization projects are often promoted by SCS employees, county agricultural agents and drainage district attorneys; that the "careful review" cited by Administrator Grant is often meaningless; that often the project design has already been frozen before disclosure to the public; and that environmentally concerned voices are either not heard or heeded.

Mr. William B. Carter, Jr. attorney for the Pamlico-Tar Conservation Coalition of Washington, North Carolina, testified: [51]

> It usually appears from the corps or SCS project plans that the channelization project is planned and financed in response to urgent pleas from the "local sponsor." Actually, the project is invariably "sold" to the landowners who ultimately form the drainage district. The requisite petition is circulated according to the advice of Soil Conservation District officials, SCS employees, county agricultural agents, and attorneys who will represent the drainage district. The most commonly employed spiel is to the effect that "your good friend up the branch, Farmer Brown, needs better drainage, he has a drainage problem. If you sign this, you can help him get it from the Government, free."

The local sponsoring organization consists almost always of persons personally interested in the project, and the committee

[50] Hearings, part 2, p. 524.
[51] Hearings, part 6, p. 3370.

or agency which reviews the project application at the State level is made up largely of farmers or representatives of soil and water conservation districts.[52]

The Subcommittee has received information that, in many instances, persons opposing channelization projects were harassed or obstructed or frozen out at public hearings on the projects.

For example, Dr. Charles H. Wharton, Professor of Biology at Georgia State University, in a June 16, 1969, letter to the late Senator Richard B. Russell, described the following episode concerning the now halted Alcovy River channelization project in Georgia:

> At the Monroe hearings at least half-a-dozen other groups were there to register disapproval of the project. Few were given time to speak. Among them were Jim Adams, president, Georgia Sportsmen's Association; Don Nichols, director, the Georgia Conservancy; Dean Fields, Small Watershed Branch, U.S. Bureau of Sport Fisheries and Wildlife. While speaking I personally was rudely interrupted from the floor and asked by the moderator not to finish my presentation. *The time had been taken up by the SCS and local sponsors.* I charge that this was no "public" meeting and that it was improperly conducted. I had in my pockets copies of letters from landowners who opposed the projects. Needless to say, there was no opportunity to enter these into the record. *Votes were taken only from the sponsors.* How could there be a negative vote? (Italic in original.)

Another instance occurred when several professors and graduate students at Louisiana State University testified in December 1972 at a Corps of Engineers hearing. They opposed an application for a Corps permit to construct a levee in connection with the SCS-sponsored Cameron Creole watershed project. The SCS State Conservationist, Mr. J. B. Earle, quickly notified University authorities. Since the University works on SCS-funded projects, it is understandable, although denied by the SCS, why several persons, including an LSU professor who testified at that hearing, considered that this "was Mr. Earle's method to try to bring

[52] The Soil Conservation Service advised the Committee on July 13, 1973, that: In Alabama the 9-member State Soil and Water Committee is comprised of five persons from Soil and Water Conservation Districts, two persons from the Auburn University Extension Service, a State supervisor of vocational agriculture, and a banker; the 7 member Louisiana committee includes 5 farmers, the Louisiana Commissioner of Agriculture and the Chancellor of LSU's Center for Agriculture Science and Rural Development. The committees in Georgia and North Carolina are all farmers, and in Mississippi all but two of the 11 member committee are farmers. See also hearings, part 2, p. 1464.

pressure on LSU officials so that in the future LSU faculty members might think twice before testifying in the democratic process." [53]

The notion that channelization projects are the product of "grassroots desires" is often a myth. For example, the Lake Verret channelization project in southern Louisiana was proposed by SCS despite the complaints of the Louisiana Conservation Council and the Mayor and Council of Morgan City, which abuts Lake Verret and draws its water from Lake Palourde lower in the watershed, that they were never consulted or given the opportuntity to be heard about the project. The work plan had already been sent to Congress for approval, when, on July 12, 1972, Morgan City Mayor C. R. Brownell sent a letter to the Office of Management and Budget in which he expressed the City's feeling about SCS's indifference to the city's needs. He said:

> First of all, the impact on the two areas is completely opposite. That which is included in the Watershed District should benefit tremendously, while that part of the "natural watershed" (which was left out of the district) would be even more adversely affected * * *. While the main purpose of the watershed is merely for drainage, the catchall, with all the deleterious effects, will be the low areas and lake, which form a vast settling basin. * * *
>
> Since we are a people * * * totally dependent upon surface water for our existences, and since we have seen all our water reservoirs obliterated by siltation and sacrificed to the great national floodway program (namely, the Mississippi and Atchafalaya Floodways) we have only one last lake or reservoir to turn to, Lake Palourde, which is in the * * * path of this Lake Verret drainage to the Gulf of Mexico. * * *
>
> We are not asking for an improvement to our way of life as our neighbors on the high ground to the north of us are doing, but we are asking that you hear us out and understand our story, a story of an appeal for survival. We cannot survive without our water supply. * * *
>
> At no time were we ever consulted in any of the so-called studies "* * *." Since our backs are against the wall, and we have continued to be ignored * * * we must continue to be critical and defiant. * * * I am

[53] Hearings, part 5, pp. 3144–3148.

> sure if this represents the attitude of our Federal Government, we can only wonder what image it wishes to present to its troubled people * * *.

After the project was approved by resolutions adopted by the Agriculture Committees of Congress, the SCS held up the project for a new environmental impact statement.

The current SCS instructions concerning public participation are aimed primarily toward promoting the watershed and channelization programs rather than encouraging public participation for the purpose of ascertaining the merits and defects of proposed projects and considering alternatives. Thus, the SCS Watershed Protection Handbook has the following section entitled "Watershed Information" (WPH, Sec. 101.30):

> An effective, full-scale and continuing program of public information is essential if local people are to use the Watershed Protection and Flood Prevention Act to solve their soil and water problems and to make full use of opportunities for development of their watershed resources.
>
> Thoroughly planned and faithfully executed public information must be an operations tool in constant use if projects developed under the law are intelligently conceived and successfully carried to completion.

The Council on Environmental Quality advised the Subcommittee that although SCS sponsors local meetings early in the planning process:

> Public participation and broad community involvement in the planning of water projects varies from project to project and agency to agency. A continuing effort by all agencies to improve the effectiveness of public participation throughout the project planning process is needed.[54]

In response, SCS stressed that Watersheds Memorandum 104, issued to its field offices on May 1, 1970, "requires at least two public meetings to discuss proposals and obtain public comment". [55] However, such meetings are held primarily by the project sponsors rather than SCS. There is no verbatim record taken at these meetings for later review by Federal officials, the sponsors, and the public. Only a summary is prepared for SCS officials in Washington. Notification to the public about such meetings is usually not adequate, as the Mayor of Morgan City observed.

Furthermore, as SCS Memorandum 104 emphasizes, SCS di-

[54] Hearings, part 5, p. 2806.
[55] Hearings, part 5, p. 2850.

rects the local sponsors of the project (who generally have a financial interest in it) to "assume the necessary leadership" in carrying out the "information program", and instructs the SCS State Conservationist "to continue to assist" the local sponsors "in promoting this program." (WPH, Sec. 101.302h.)

In contrast, there are Executive orders which envisage more active public participation in hearings held by SCS itself. Executive Order 10584 (December 18, 1954), as amended by Executive Order 10913 (January 18, 1961), prescribed rules for the administration of the program under Public Law 566. The order provides, in Section 2(h), that the Secretary of Agriculture shall hold "public hearings at suitable times and places when he determines that such action will further the purposes of Public Law 566." Furthermore, Executive Order 11514 (March 5, 1970), which implements the National Environmental Policy Act of 1969, requires *all* Federal agencies to develop "procedures to ensure the fullest practicable provision of timely public information and understanding of Federal plans and programs with environmental impact in order to obtain the views of interested parties." These "procedures" must include, "whenever appropriate, provision for public hearings." (Sec. 2(b).)

The importance of adequate public hearings was emphasized by Edward Lee Rogers, General Counsel of the Environmental Defense Fund, in his testimony before the Subcommittee, as follows: [56]

> Procedures should be adopted which would assure input by citizens, citizen groups, and relevant Federal and State agencies in the early or survey stage of the decisionmaking process leading up to the making of the basic decision. The public notice or inquiry made by the lead agency should indicate that certain interests have recommended that certain problems ought to be alleviated and/or certain benefits ought to be provided and state at that time as specifically as possible what those problems are.

The Committee notes that the Corps of Engineers, on January 19, 1973, promulgated a regulation (38 F.R. 1928) on public meetings. The regulation "sets forth the policy, responsibility, and guidance for holding formally organized, announced, and recorded public meetings" in connection with the Corps' Civil Works programs. The Committee commends the Corps on this progressive step.

[56] Hearings, part 6, p. 3337.

But the SCS has not adopted similar regulations.

The Committee therefore recommends as follows:

The Soil Conservation Service should comply with Executive Orders 10584 of December 1954 and 10913 of January 1961 and promptly adopt new regulations designed to promote public participation in the formulation of its projects. Such regulations should include provisions that recorded public hearings be held, after adequate notice, by SCS on all SCS-financed small watershed projects, whenever there appears to be sufficient public interest, and that, in case of doubt, hearings will be held.

Such public hearings will not impair the "grassroots" philosophy of the program, but should insure better and more widespread public participation.

Memorandum 104 and other guidelines, instructions, memoranda, and other documents setting forth general SCS policy or interpretations of general applicability have never been published in the Federal Register, even though the Administrative Procedure Act requires publication of such documents (5 U.S.C. 552(a)(1) (D) and (E)). Although most of these documents are presumably available in loose-leaf binders in SCS offices and elsewhere, they are not available in the Code of Federal Regulations in the same manner as other Federal regulations, policy statements, etc. In addition, the provisions of the SCS's Watersheds Handbook and many other basic documents issued by the Administrator of the SCS—a significant portion of which are certainly regulatory in nature—have never undergone the scrutiny of public comment in accordance with the proposed rulemaking procedures of the Administrative Procedure Act (5 U.S.C. 553). Indeed, the SCS's very short published regulation (7 CFR 600.3), issued pursuant to Public Law 566, sets forth the procedures for applying for financial assistance for small watershed projects, but does not mention any involvement by environmental agencies or the public in this process. It is quite misleading.

SCS Administrator Grant advised the Subcommittee on July 13, 1973, that the SCS had set September 15 "as a target date to publish in the Federal Register all policy related to programs administered" by SCS. The Committee commends SCS for setting that "target date," but notes that SCS had not met that target.

The Committee therefore recommends as follows:

In accordance with the provisions of the Administrative Procedure Act concerning rulemaking and public information, the Soil Conservation Service should promptly publish in the Federal Register (a) all documents which are in fact regulations, although

not so designated by the SCS, and (b) all other statements of general policy and interpretations of general applicability.

IV. THE BENEFICIARIES OF CHANNELIZATION PROJECTS ARE NOT ALWAYS IDENTIFIED BY RESPONSIBLE FEDERAL AGENCIES IN DOCUMENTS AVAILABLE TO THE PUBLIC

Surprising as it may seem, it took a lawsuit to disclose that Federal agencies, in describing channelization projects, their attributes and shortcomings, generally do not reveal who will be the beneficiaries of the project. In *NRDC* v. *Grant, supra,* the district court found that the proposed environmental impact statement for the Chicod Creek Watershed project in North Carolina failed to "disclose that over 17% of the acreage to be benefited by the Project is held by the Weyerhaeuser Company, a large lumber company."

The Chicod Creek situation is not unique. For example, the March 31, 1973 report on channel modifications, prepared by the Arthur D. Little Company for the Council on Environmental Quality, made an appraisal of the economic benefits of SCS's Crow Creek Watershed Project in Tennessee and Alabama. The report noted that about 2,000 residents of Crow Creek Valley may benefit from the project and then said (p. 39–19 of the ADL report):

> On the other hand, and curiously, one of the primary beneficiaries of the flood control features of this project is not identified in any of the record. This is the Nashville, Chattanoog[a] and St. Louis Railroad [now the L & N Railroad], whose main line and heavily used trackage parallels the entire reach of the channel in both States from north to south. * * * It is clear that in many reaches of the stream the flood conveyance works are within a few hundred feet of the railroad right-of-way, yet the record is strangely silent on any benefits associated with the railroad.

Subcommittee Chairman Reuss, after mentioning several other examples of this SCS practice of non-disclosure policy, said: [57]

> When we asked the SCS to explain why it doesn't make public the identity of these large corporate beneficiaries of Federal flood control funds, the SCS replied that it has no "obligation" to do so. This seems to be a

[57] Hearings, part 5, pp. 2790–2791.

> narrow view of the public interest. Unless there are special reasons for not infringing on individual rights of privacy, we think there is considerable public interest in letting the taxpayers know where their funds are being spent and who is being benefitted by the Federal subsidy. SCS is certainly not precluded by law from disclosing who the beneficiaries are, and it has given us no reasons for not doing so.

When questioned about this at the Subcommittee's March 1973 hearings, the SCS witnesses, Messrs. Norman A. Berg, Richard B. Parker, and William B. Davey, said, in a colloquy with Congressman Paul N. McCloskey, Jr.: [58]

> Mr. MCCLOSKEY. Well, when you determine your benefits to the community do you not determine the benefits to the land in the watershed?
>
> Mr. BERG. Yes.
>
> Mr. MCCLOSKEY. By increased valuation of that land?
>
> Mr. BERG. Yes, sir; and the protection that is afforded by the project.
>
> Mr. MCCLOSKEY. And you do that on a per acre basis or on a per landholder basis? * * *
>
> Mr. PARKER. Primarily on a per acre basis, increased production, reduced production costs, improved quality of the crop, and so forth, are the major items considered. This type of information we need to gather from the individual farmers to use in making the benefit evaluation. It is the damage schedules that we are talking about from which we get this privileged information from individual farmers, as to what their damages are, what their crops are, what their income is, what their crop yields are and so forth.
>
> We have said that we do not want to divulge that type of information to the general public.
>
> Mr. MCCLOSKEY. Is there any reason to keep secret or keep privileged the estimated increase in the value of a man's land because of this project?
>
> Mr. PARKER. No. I do not think that is kept secret. Information concerning benefits on a per acre basis is contained in the watershed work plan or in the supporting data files for the plan.
>
> Mr. MCCLOSKEY. Then why should you keep secret the identification of the beneficiaries of this project?

[58] Hearings, part 5, pp. 2932–2933.

Mr. BERG. I do not think we do; it is not intentional. It would certainly be available to anybody who wanted to obtain that information in any particular project.

Mr. PARKER. We usually have landowner maps available.

Mr. MCCLOSKEY. The testimony we have received indicates that the Soil Conservation Service environmental impact statements have been inadequate. I assume from your testimony here this morning that you are cognizant of that. Is that correct?

Mr. BERG. We are doing all we can to make them better each day and each week; yes.

Mr. MCCLOSKEY. And why should the Soil Conservation Service be unwilling to identify the beneficiaries of the project and the landowners involved? * * *

Mr. DAVEY. *We have not specifically identified beneficiaries in either the impact statement or the work plan.* We do include maps of the work plan which show the total area benefited. Now, ordinarily, the sponsoring organizations create a legal entity to carry out their share of the costs and to assume operation and maintenance. Ordinarily when one of these is created, it is by judicial apparatus under State law in which at that time there is published in the newspapers—under State law—all of the benefited area, including the land descriptions and land holdings. There are hearings held and it is the sponsor's obligation to assess the taxes which includes beneficiaries. *So this is really all brought out, but it is brought out primarily as part of their legal entity. We have not included it in the Watershed work plan, so there is no attempt to keep it secret.* We just never thought there was a real need since this other step was involved. (Italic supplied.)

Even if all the beneficiaries of the channelization project were listed in the "legal notices" published in local newspapers when the sponsoring organization was established, they are not mentioned in any Federal document which is made available to the public, including the work plan and accompanying map. Few people read such "legal notices," and even those who do rarely associate the names of the organizers with any proposed watershed channelization project.

CEQ Chairman Train testified that "the public and the Congress are entitled to know publicly who the beneficiaries

are. * * * I see no privilege against such disclosure. * * * And when in doubt, I would always say full disclosure is the appropriate course." [59]

It is not enough for the SCS or any other agency to describe in general terms the area to be benefited by the project. The public, which will bear a substantial share of the project costs, should be able to ascertain who, in fact, are the beneficiaries of the project. The public is entitled to know, for example, that all or most of the beneficiaries are a few large corporations, and to decide on the basis of all the facts whether the project is meritorious.

Since SCS admits there is no reason to keep the identity of the beneficiaries secret and insists that it has not sought to do so, the Committee believes that SCS should require that the proposed work plan include the identity of all known beneficiaries. Identifying all beneficiaries of the larger projects of the Corps and the Bureau of Reclamation may be a little more difficult, but both agencies should certainly endeavor to identify *all* of the major beneficiaries, and as many of the lesser ones as feasible, in the project reports.

The Committee therefore recommends as follows:

The Soil Conservation Service, the Corps of Engineers, and the Bureau of Reclamation should promptly adopt a policy of fully identifying all known project beneficiaries in pertinent project documents which are made available to the public, including environmental impact statements.

V. SCS PROCEDURES FOR KEEPING SOME DATA ON FLOOD DAMAGE CONFIDENTIAL ARE NOT WELL-DEFINED AND RESULT IN WITHHOLDING DATA FROM THE PUBLIC IN VIOLATION OF THE FREEDOM OF INFORMATION ACT

The *Chicod Creek* case mentioned earlier in this report also involved SCS's efforts to withhold from the public the basic data which the SCS used in making its calculations of the costs and benefits of the projects, including land use, crop yield and flood damages. These data had been gathered by SCS by interviewing people within the watershed and obtaining their responses to questions on various questionnaire forms. The district court, after an "*in camera* inspection," ordered SCS to provide the data to the plaintiffs, but required deletion of the names, addresses, and income data obtained on a confidential basis.

In the course of its examination of SCS procedures, the Subcommittee found that SCS had been collecting information from

[59] Hearings, part 5, p. 2873.

the public on questionnaire forms or schedules which had not been approved by the Office of Management and Budget, although such approval is required under the Federal Reports Act (42 U.S.C. 3501–3511).

SCS later revised its questionnaire forms and presented to OMB for approval, as required under the Federal Reports Act, the following six forms, all of which were approved by OMB about May 1972:

OMB Form No. 40–R3809 (Flood Damage-Agriculture);

OMB Form No. 40–R3805 (Flood Damage-Residential Projects);

OMB Form No. 40–R3808 (Flood Damage-Commercial-Industrial);

OMB Form No. 40–R3806 (Flood Damage-Transportation-Utilities);

OMB Form No. 40–R3807 (Irrigation Questionnaire); and

OMB Form No. 40–R3804 (Drainage Questionnaire).

The Director of OMB advised the Subcommittee, in his letter of August 8, 1973, that (a) SCS, in presenting the forms to OMB for approval, had stated that "any basic data collected relative to financial losses will be kept confidential;" (b) since two of the questionnaire forms (Drainage and Irrigation) contained no questions concerning financial or commercial data, OMB understood that SCS did not request, and OMB did not approve, confidentiality for information collected on these two forms; and (c) as to the other four questionnaire forms, confidentiality would apply only as to the data therein "relative to financial losses."

However, SCS Administrator Grant's Watersheds Memorandum 122 of October 31, 1972, transmitting and explaining the six questionnaire forms to SCS field offices, advised them that all the information on all six forms was to be treated as confidential.

It is clear that the SCS Administrator's Memorandum of October 31, 1972, was not in conformity with the Freedom of Information Act. That Act specifies (5 U.S.C. 552(c)) that it "does not authorize withholding of information or limit the availability of records to the public, except as specifically stated [therein]." Section 552(a)(3) provides that, in any court proceeding to compel disclosure of agency records, "the burden is on the agency to sustain its action" of refusing to make the records available to the public. Federal courts have ruled that, "taken

together, sections 552(c) and 552(a)(3) mean that [an agency] must bear the burden of proving that the records it refused to disclose are specifically included in one of the exemptions of section 552(b)," and that such exemptions must be construed narrowly. *Legal Aid Society of Alameda County* v. *Shultz,* 349 F. Supp. 771 (N.D. Calif. 1972). Furthermore, the courts have consistently stated that "an entire document is not exempt merely because an isolated portion need not be disclosed. Thus, the agency may not sweep a document under a general allegation of exemption, even if that general allegation is correct with regard to part of the information." *Vaughn* v. *Rosen,—F.2d——*(D.C. Cir., No. 73-1039, Aug. 20, 1973). "It is a violation of the [Freedom of Information] Act to withhold documents on the ground that parts are exempt and parts non-exempt. In that event, 'suitable deletions' may be made." *Legal Aid Society of Alameda County* v. *Shultz,* 349 F. Supp. 771, 777 (N.D. Calif. 1972).

The SCS Administrator was fully aware of how the Freedom of Information Act affected the confidentiality of these questionnaires. In December 1971, SCS asked the General Counsel of the Agriculture Department whether SCS may "hold confidential economic flood damage and related data" collected from the public. On February 10, 1972, Assistant General Counsel James D. Keast wrote to the Administrator that "the economic data collected from individuals in the formulation of the benefits to be derived from a watershed project would fall within the intent of" exemption (4) of the Freedom of Information Act (5 U.S.C. 552(b)(4))—which covers "trade secrets and commercial or financial information obtained from a person and privileged or confidential"—and "therefore may be held as confidential."

He stated clearly that "the only [exemption] that may be applicable * * * is the one on information given in confidence" and carefully limited his opinion to "economic data collected from individuals."

Yet in the face of this counsel, the SCS Administrator's memorandom provides that all the information on all six forms shall be treated as confidential. However, none of the matters covered in the irrigation and drainage questionnaire relates to "commercial or financial information." Furthermore, it is highly questionable that all of the data asked for in the other forms are covered by exemption (4). Surely, responses to questions such as the following are not within that exemption:

What changes in land use have you made due to floods?

During what seasons are floods most common?

How often do large floods occur?

Depth of water in basement, on or above first floor, on grounds or lawn, in garage, or in automobiles.

On July 17, 1973, Subcommittee Chairman Reuss and Ranking Minority Member Vander Jagt wrote to the OMB Director requesting OMB to review the propriety and legality of the SCS forms. They also questioned the propriety of the SCS practice of making oral pledges of confidentiality without notation thereof on the form. In addition, they requested OMB not to approve an agency's request for confidentiality on its questionnaire forms unless the agency shows that such confidentiality is needed to carry out effectively the agency's program and that it has authority to hold the data obtained confidential. They noted that if SCS holds confidential all the information on the six questionnaire forms, the public and OMB "are effectively foreclosed from challenging the SCS calculations" concerning a project's benefits.

The OMB Director responded on August 8 that he had asked SCS to review its confidentiality procedures and practices to make them consistent with its representations to OMB. He indicated that SCS would not withhold from the public any information on the Drainage and Irrigation questionnaires nor any information from the other four questionnaires except those relating specifically to financial losses. However, OMB's response did not address two of the Subcommittee's suggestions of July 17. The Subcommittee therefore reiterated them in its letter of August 10, 1973, to OMB.

The first related to the fact that the six SCS forms, and presumably other SCS forms, do not contain any statement as to confidentiality. The OMB letter to the Subcommittee noted that (a) the responses to the questions are obtained by personal interview, (b) the SCS has instructed its representatives to tell the respondents the information would be kept confidential, and (c) SCS says its representatives provide such notification to respondents as a "standard operating procedure." Nevertheless, the SCS has, according to OMB, apparently agreed to change its instructions to assure that the interviewer "shall give assurances of confidentiality." The Subcommittee's letter stated:

> We believe that any assurances of confidentiality authorized by your Office and given to respondents, irrespective of whether the answers to the questions on the forms are written by the SCS interviewer or the respondent, should be buttressed by specific notation on the form, namely, that the responses to the particular questions for which confidentiality is assured will be

treated as confidential *unless the respondent indicates otherwise.*

There are two reasons for our position.

1. There are many respondents who are willing to provide information to the Government without having their answer kept confidential. There should be some mechanism, either on the form or otherwise, to enable a notation that the respondent does not insist on confidentiality. Such information would then be available to the public. The proposed SCS instruction, requiring that the interviewer "shall" give assurances of confidentiality, irrespective of the respondent's desire on the confidentiality issue, precludes this possibility.

2. Assuming that an oral pledge by an interviewer is legally adequate, it becomes difficult or impossible, at a later time when members of the public ask for the information, to document (i) whether the pledge of confidentiality was in fact made, (ii) the scope of the pledge, and (iii) the respondent's understanding of the pledge.

Proper notation of confidentiality on the form would also have prevented the inconsistency between SCS's representations to your office and SCS's subsequent practice of treating as confidential all the questions on the six forms mentioned in our letter. Consider, for example, the court's dilemma in the *Chicod Creek* case which we mentioned in our July 17 letter. In that case, the SCS asserted confidentiality of questionnaire responses with no distinction made between data within and data not within exemption (4) of the Freedom of Information Act. The court was forced to review the data *in camera* before the non-exempted data could be released. A citizen should not have to go to this length to obtain nonconfidential data. A notation on the form specifying which data is afforded confidentiality would help to avoid this problem.

The Committee shares the Subcommittee's concern and therefore recommends as follows:

The Soil Conservation Service should promptly include on its questionnaire forms concerning irrigation, drainage and flood damages a statement which specifies, with respect to commercial and financial data supplied by a respondent, that the respondent shall indicate whether he desires the data to be kept confidential and exempt from disclosure under the Freedom of Information

Act (5 U.S.C. 522(b)(4)), and that if he consents to public release thereof he shall indicate his consent in writing.

The Subcommittee's second suggestion related to OMB's failure to seriously address the confidentiality question when it approved the SCS forms. The Subcommittee's letter said:

> * * * it should be kept in mind that the Freedom of Information Act created a new policy of disclosing, rather than of withholding, information. As the President said on signing the Act, that policy must "be served by a constructive approach" by every official "to make information available to the full extent consistent with individual privacy and with the national interest."
>
> It should, therefore, be the duty of OMB and every other agency of Government to strive to make disclosure the general rule and not the exception. OMB should require full justification for every agency's request to reduce the public's opportunity to receive information in the Government's possession. OMB should approve requests for confidentiality only where it is shown that confidentiality is needed to carry out effectively the agency's programs and otherwise meets the requirements of the law.
>
> OMB does not give pro forma approvals to all questionnaires. This was clearly brought out during our long efforts to obtain approval by the former Budget Bureau of a national industrial wastes inventory questionnaire. Your Office determines whether or not the questionnaire should be approved, and in this process, frequently requires that some questions be revised, deleted, etc. A pledge of confidentiality is just as important. OMB should not give pro forma approvals to an agency's desire to hold the requested data confidential merely because it asserts that such a pledge may make it easier to obtain the data. The public interest in disclosure should be paramount and the burden should be on the agency to prove that confidentiality is authorized and in the public interest. Since your Office must approve the questionnaire, you should insist that the agency sustain this burden *before* you approve the form.
>
> We believe that the recommendations we suggest are more in accord with the basic policies of the law than is the routine approval of every request for confidentiality, even though the type of information may be within

the confidentiality exception of 5 U.S.C. 552(b)(4). (Italic in original.)

The Committee agrees with the Subcommittee's suggestion. This approach was followed by the Corps of Engineers in the case of applications filed for permits under the Refuse Act of 1899 (33 U.S.C. 407) (see Corps' regulations of April 7, 1971, 38 F.R. 6564).

VI. THE BUREAU OF OUTDOOR RECREATION, BUREAU OF SPORT FISHERIES AND WILDLIFE, AND ENVIRONMENTAL PROTECTION AGENCY HAVE, UNTIL RECENTLY, PERFORMED POORLY IN THEIR SCRUTINY OF CHANNELIZATION PROJECTS

Although public concern over the effects of channelization has increased substantially during the past few years, at local, regional, and national levels, the Federal agencies charged by Congress to protect the environment have often failed to safeguard the public interest against the poorly planned or environmentally harmful channelization projects.

A. THE BUREAU OF OUTDOOR RECREATION DID NOT PERFORM ITS STATUTORY ROLE WITH RESPECT TO SCS PROJECTS

In 1963, Congress enacted the Organic Act of the Interior Department's Bureau of Outdoor Recreation (Public Law 88–29 of May 28, 1963, 16 U.S.C. 460 l, *et seq.*), which declares that it is "desirable" policy to insure present and future generations of Americans "adequate outdoor recreation resources" and that all governmental and private interests take "prompt and coordinated action * * * to conserve, develop, and utilize such resources for the benefit and enjoyment of the American people." The Act further directs the BOR to "cooperate with and provide technical assistance to Federal departments and agencies" and to "promote coordination of Federal * * * activities generally relating to outdoor recreation" (16 U.S.C. 460 l (g)). Yet, despite this congressional recognition of the need for, and importance of, recreation to the public, the BOR has completely failed to carry out this statutory mandate in connection with small watershed projects of the SCS.

At the Committee's 1971 hearings, the BOR witness, Mr. William Lawson, stated categorically that while the BOR "has authority to do so," it "does not routinely review" SCS projects because of a lack of "funds and manpower," and that since 1965 the BOR has not requested any funds for such review. However, he stated that the BOR had initiated in January

1971 a "pilot study" in the southeastern United States to provide information for future BOR review of SCS projects.[60]

On September 2, 1971, the BOR's Regional Director in Atlanta, Georgia, Mr. Roy K. Wood, reported to the BOR Director the results of the pilot study. His report noted that SCS reservoir projects in the southeast have enhanced public recreation, but critized the SCS channelization program and its adverse effects on recreational resources. He said: [61]

> In other parts of the region, reservoir sites are often located in forested headwaters some distance from the beneficiaries of flood protection. In this situation, channelization is a more immediate and satisfactory solution to the problem. Farm income in the South is, on the average, below that in the rest of the Nation. This has tended to foster the least expensive means of flood protection to achieve short-term goals. For these and other reasons, *channelization became a major feature of the small watershed program in the Southeast. Its effects on the recreational resources and natural environment have reached disastrous proportions.* Basic to the success of the small watershed program in the Southeast, as in other parts of the Nation, is the skill with which the Soil Conservation Service sells its program.
>
> *The work plans which were studied did not consider the values inherent in natural free-flowing streams nor the values of the lands and forests as recreation resources associated with the streams.* The benefit-cost ratios upon which the work plans were justified do not, in these four instances, represent a true evaluation of cost and benefits. *Costs of the projects did not include benefits foregone through the destruction of streams and stream-associated resources.*
>
> *Procedures employed in preparing small watershed work plans have fostered the steady destruction of streams and associated lands vital to natural life systems and recreation values. Fragmented localism that characterizes small watershed planning frustrates the attainment of recreation goals and environmental objectives.* Part of the reason for this situation stems from the limited vision of sponsors when planning the recreation and environmental functions of the watershed plans. Sponsors are not equipped, generally, to measure the lo-

[60] Hearings, part 2, p. 488.
[61] Hearings, part 5, pp. 3273–3275.

cal, regional, or national importance of scenic areas or recreation potentials. Another force causing this situation is the dependency of local people on economic productivity of a watershed's resources for their living. Resource uses that best serve the long term broad public interest must often confront powerful local short-term economic interests. Sponsors are unwilling to yield powers long vested in there [sic] to outside individuals or agencies. A third factor which magnifies the problem of the small watershed program is the rapidly changing character of the region. Once it was true that if one swamp were drained, one more stream channelized, it mattered little since there were others. This is no longer the case. Today we are dealing with the few remaining unaltered streams and swamps. The time has long since passed for single purpose local planning which is oblivious to the regional situation. The frontiers are gone but the frontier mentality lingers on to the detriment of our national heritage and the overall public welfare.

Channelization has produced a tumultuous clamor among the knowledgeable and concerned public. This outcry has as yet produced no discernible effect on the current watershed work plan but has at least stirred the Soil Conservation Service to react superficially.

* * * the Soil Conservation Service cannot accept the fact that anything the Soil Conservation Service does could be regarded as detrimental to the natural environment. Channelization is still considered stream improvement.

When confronted with irrefutable evidence of environmental degradation the responsibilities for the plan are laid at the feet of the sponsor. Sponsors, on the other hand, have not been conditioned to accept the more expensive measures nor a lesser degree of protection for the sake of a greater public good.

* * * * *

The long term broad public interest must be represented in any plan formulated with respect to the natural environment. *We believe protecting the diminishing natural recreation and scenic areas in the small watershed must be a priority concern of this Bureau.* The decisionmaking process, developed under Public Law 83–566, places priority upon flood control and drainage. Re-

> creation and associated values are not project *purposes of equal significance—a situation which appears to be a matter of interpretation rather than a deficiency in the act.* (Italic supplied.)

Mr. Wood concluded that the SCS program "is of such proportions and its impact on the recreation and associated values of such serious consequence" that the BOR's "participation in the program has become essential." He estimated that adding 5 professionals to the BOR staff and increasing the BOR budget by $140,400 would allow the BOR to study "in detail" about 30 projects annually and another 10 percent "could be reviewed more or less superficially" and comments provided. He urged that the BOR and SCS enter into a memorandum of understanding whereby the Bureau's role would be as a "public advocate" of recreation needs.

On January 18, 1972, the BOR's Assistant Director for Federal Programs, Mr. R. L. Eastman, expressed his concurrence with Mr. Wood's recommendations in a letter to the Bureau's Director, G. Douglas Hofe, Jr. Mr. Eastman said: [62]

> The results of the pilot study indicate that watershed projects have the potential for both enhancement and degradation of recreation and related environmental values; that work plans did not adequately consider values inherent in natural, free-flowing streams and associated lands, and that local interests are receiving limited information on which to formulate watershed plans for recreation and environmental functions.
>
> Regional Director Wood recommends participation in the small watershed program and that a memorandum of understanding be developed between this Bureau and the Soil Conservation Service to define their respective roles.
>
> We concur with this recommendation and note that the other five regional directors have, based upon their value judgments, also recommended Bureau involvement.

The BOR Director approved this recommendation on January 25, 1972. But nothing has been done to implement it.

When Subcommittee Chairman Reuss asked the Interior Department about implementing the recommendation, the Department responded in March 1973 that BOR has not done so "because funds and manpower have not become available" and that no funds were included in the President's budget for fiscal year

[62] Hearings, part 5, pp. 3275–3278.

1974, nor were any requested.[63] The Department stressed "that other areas among its responsibilities delegated by the Congress and the Secretary have priority," but did not identify what those "other areas" are.

The SCS informed the Subcommittee prior to the March 1973 hearings that it would be "glad to consider any memorandum of understanding that might be proposed by the BOR," and would "welcome full participation by BOR in the watershed project planning process." [64]

The BOR has procrastinated far too long in carrying out its responsibilities. Surely, when a Bureau is as critical of a program as BOR is of the SCS program, it has an obligation to work to improve it and to ask Congress for adequate funds and personnel to do the job. But it has not done so. Instead, BOR has been content to sling rocks at the SCS, while remaining completely aloof and providing no substantive aid to the SCS in mitigating the deficiencies which the BOR criticizes.

The Committee therefore recommends as follows:

The Bureau of Outdoor Recreation should begin immediately to review SCS small watershed projects (a) to ascertain their probable effects on recreational and esthetic values, and (b) to advise SCS whether, or the conditions under which, SCS should approve such projects.

B. THE LIMITED STATUTORY AUTHORITY OF THE BUREAU OF SPORT FISHERIES AND WILDLIFE HAS HAMPERED ITS EFFORTS TO PROTECT WILDLIFE FROM DESTRUCTION BY CHANNELIZATION

Although it is the Nation's top wildlife agency, the BSF&W [65] has been unable to exercise its potential influence on channelization projects. In large part, the Bureau's failure stems from the limited statutory bases on which the Bureau operates vis-a-vis the Corps of Engineers, the Bureau of Reclamation, and the SCS.

The Fish and Wildlife Coordination Act (16 U.S.C. 661, *et seq.*) is the basic statute authorizing the Bureau to comment on projects of the Corps of Engineers and the Bureau of Reclamation. But that statute has been construed, both by the Agriculture Department's Solicitor and by the Comptroller General,[66] as not

[63] Hearings, part 5, p. 2816.

[64] Hearings, part 5, p. 2857.

[65] The Interior Department's Fish and Wildlife Service, established by the Fish and Wildlife Act of 1956 (16 U.S.C. 742b), consisted of the Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries. Reorganization Plan No. 4 of 1970 (effective October 30, 1970, 35 F.R. 15624, 84 Stat. 1290) transferred the Bureau of Commercial Fisheries to the Commerce Department's National Oceanic and Atmospheric Administration.

[66] The Solicitor's opinion, dated April 15, 1970, is reprinted in Hearings, Part 5, p. 2942. The Comptroller General's opinion was rendered in a letter of May 18, 1970, to Congressman Ben B. Blackburn (B-169431).

being applicable to the SCS's small watershed projects. Instead, the Bureau must look to section 12 of Public Law 83–566 for its statutory basis to comment on SCS projects.

Section 9 of the Coordination Act (16 U.S.C. 666c) specifies that the Act "shall not apply" to TVA. Thus, the Bureau has no statutory basis for reviewing and commenting on TVA water resource projects.

The Coordination Act was first enacted in 1934 for the purpose of assuring that fish and wildlife conservation "receive equal consideration and be coordinated" with other project purposes of water resources development programs. In 1946, it was completely revised to broaden its scope. At that time, the House Committee on Agriculture, in its report on the bill H.R. 6097, which became the 1946 Act, said (H. Rept. No. 1944, 79th Cong., 2nd Sess., April 17, 1946, p. 1):

> The proposed bill would place in effect a much-needed program and facilities for the effectual planning, maintenance, and coordination of wildlife conservation, management, and rehabilitation.

Experience under the 1946 Act showed, however, that the Coordination Act needed further strengthening to achieve fully its intended purpose. Thus, the House Government Operations Committee, in its report entitled "Army-Interior Reservoir Land Acquisition Policy" (H. Rept. 85–1185; Aug. 16, 1957) stated (pp. 31, 32):

> The committee believes that the public interest in wise conservation of our national fish and wildlife resources requires * * * *the strengthening of the Coordination Act.* The committee is gratified that a draft of amendments to the Coordination Act prepared by the Interior Department has been endorsed by all 48 States and has already been introduced in the 85th Congress by Congressman Henry S. Reuss of Wisconsin (H.R. 8747) and Congressman Lee Metcalf of Montana (H.R. 8631). *These amendments would permit* the Fish and Wildlife Service to accept donations of land and funds; *would broaden its authority to consult with respect to proposed as well as authorized projects and also those receiving Federal financial or technical assistance;* would provide for the development and improvement of wildlife resources, as well as mitigation of losses thereof; would authorize acquisition of lands for such purposes by Federal construction agencies; and would make other im-

portant improvements in the Coordination Act. The committee believes the basic objectives of these amendments are in the public interest and recommends their favorable consideration by the legislative committees of Congress which will deal with them. (Italic added.)

The 1958 amendment to the Act did not include the phrase requiring consultation on projects "receiving Federal financial or technical assistance." But it enabled improved protection for our Nation's fish and wildlife resources by strengthening the consultation requirement in section 2(a), as follows:

> * * * *whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the United States, or by any public or private agency under Federal permit or license,* such department or agency *first shall consult* with the United States Fish and Wildlife Service, Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular State wherein the impoundment, diversion, or other control facility is to be constructed, with a view to the conservation of wildlife resources by preventing loss of and damage to such resources as well as providing for the development and improvement thereof in connection with such water-resource development. (Italic supplied.) [67]

This "consultation" requirement was reviewed and analyzed in this Committee's September 18, 1972, report entitled "Protecting America's Estuaries: Puget Sound and the Straits of Georgia and Juan de Fuca" (H. Rept. 92–1401, p. 19), in connection with the Corps' permit program. The Committee noted that, until recently, the Corps had followed a practice of transmitting to the BSF&W notices of permit applications and other documents for comment thereon. If the BSF&W failed to comment within a specified time, the Corps proceeded to act on the application on the assumption that the BSF&W had none to make. But in several instances, the BSF&W did have substantial comments, but was simply late in making them. The Committee's report emphasized

[67] Section 304 of the President's proposed bill to establish a new Department of Energy and Natural Resources provides that the "requirement" for such consultation with the U.S. Fish and Wildlife Service would be "terminated" and the function transferred to the Secretary of the new department (H. Doc. 93–119, June 29, 1973, p. 12).

that to "comply with law, the Corps has an obligation to seek the Service's formal comments on each permit application or determine that the Service has none to make." This obligation also extends to water resource projects constructed by the Corps and the Bureau of Reclamation.

During its investigations of the BSF&W's efforts to be responsive to requests for comments from the Corps and other agencies under the Coordination Act, the Subcommittee learned that, in many instances, for various reasons, including inadequate funding and personnel, the BSF&W and its sister agency, the Commerce Department's National Oceanic and Atmospheric Administration, had provided comments and recommendations on only some matters, or on none at all, which are subject to the "consultation" requirements of the Act. Subcommittee Chairman Reuss and Congressman John D. Dingell, who is Chairman of the Fisheries and Wildlife Conservation and the Environment Subcommittee of the House Committee on Merchant Marine and Fisheries, in a jointly signed letter of June 6, 1973, to the Interior and Commerce Departments, objected to this practice. They noted that both agencies have an "obligation" under the Act "to at least inform in writing" the consulting Federal agencies "and, most importantly, the public" that either the project "will have no significant effect on fish, shellfish and wildlife resources, or that you lack the funds and manpower to comment thereon. * * *" They stressed that the Federal consulting agencies cannot meet their obligation under the law, if the BSF&W and NOAA "fail to inform them in a timely fashion", or if they "are silent" on the request.

The Committee concurs with their views and notes that on July 24, 1973, Acting Secretary of Commerce John K. Tabor replied that NOAA does "not intend to waive the right to receive any permit application," and that on July 13, 1973, BSF&W instructed its Regional Directors to report on "every permit application." Both agencies have now agreed to state, whenever they fail to make substantive comments on an application, that lack of personnel, funds, or technical knowledge prevented their doing so.

The "consultation" requirement is also subject to section 2(b) of the Act, which requires that the "reports and recommendations" of the Secretary of the Interior shall be "based on surveys and investigations conducted by the United States Fish and Wildlife Service and the appropriate State fish and game agencies" (16 U.S.C. 662(b)). Thus, as we have noted in previous

reports,[68] Congress intended that Federal agencies would obtain the views of the Federal fish and wildlife agencies now in the Interior and Commerce Departments in the form of written reports based on the agencies' professional and technical responsibilities and expertise, free from departmental policy and political considerations. Such reports are, under the Freedom of Information Act, available to the public.

Section 3 of the Act generally provides that whenever a project is to be carried out by any Federal agency, adequate provision shall be made, consistent with the project's primary purposes, for its use for the conservation, maintenance and management, and improvement of its wildlife resources and habitat. Section 3 also provides that land and waters may be acquired by Federal construction agencies for wildlife conservation and development in connection with a project.

Pursuant to these "consultation" provisions of the Coordination Act, the Corps and the Bureau of Reclamation have "consulted" with the fish and wildlife agencies and the latter have studied and filed reports on many, but not all, of their water-resource projects. Sometimes the results have protected wildlife values or mitigated the damages resulting from the water projects. More often, however, the results have been spotty and inadequate.

But the "consultation" procedures and results have been even more ineffective with regard to SCS projects. As far back as 1947, the Solicitor of the Department of Agriculture, in Opinion No. 5353, concluded that the Coordination Act of 1934, as amended in 1946, did not apply to drainage operations of the SCS. The Solicitor said: [69]

> Drainage operations of soil conservation districts are not conducted by a department or agency of the United States but are conducted by the districts themselves, and are not performed under Federal permit. It is our opinion, therefore, that these operations are not subject to the requirements of the act of August 14, 1946, *supra.*
>
> All activities of a soil conservation district are carried out in the name of the district, which is not a Federal agency but a local unit of government organized under State law. The Soil Conservation Service cooperates

[68] H. Rept. No. 91-1433, August 19, 1970, entitled "Protecting America's Estuaries: The San Francisco Bay and Delta;" H. Rept. 92-1401, September 18, 1972, entitled "Protecting America's Estuaries: Puget Sound and the Straits of Georgia and Juan de Fuca," p. 55.

[69] Hearings, part 5, p. 2945-2946.

> with districts by extending technical advice, material, equipment and other assistance, but the work of a district is its own responsibility and undertaking. A district's activities can in no sense be considered those of a department or agency of the United States. Also, districts do not operate under Federal permits. Therefore, it is clear that the activities of soil conservation districts do not come within the purview of the aforesaid act.
>
> * * * * *
>
> There is, of course, nothing to preclude a district from requesting the assistance of the Fish and Wildlife Service whenever it is deemed desirable, but we find nothing in the provisions of the act which requires that the Fish and Wildlife Service be consulted before the district undertakes drainage operations.

In 1970 (see footnote 66) the Agriculture Department's Solicitor and the Comptroller General ruled that the 1958 amendments to the Coordination Act did not change that conclusion as to SCS projects. They pointed out that the final version of the 1958 amendments to the Coordination Act did not provide for consultation with the Fish and Wildlife Service on projects "receiving Federal financial or technical assistance" as the Interior Department and Congressman Reuss proposed in 1958. Instead, the 1958 Act contained a section 3 which added a new section 12 to the Small Watershed Protection and Flood Prevention Act dealing with this consultation problem. Thus, in the case of P.L. 566 programs, according to the Comptroller General's opinion, "Congress has applied separate and different coordination requirements * * * than to Federal construction agency water resource development projects or to non-Federal agency projects constructed under Federal license or permit," and therefore "* * * the provisions of Public Law 85–624 [the Coordination Act amendments of 1958] * * * were not meant to, and do not, apply to Public Law 83–566 Watershed projects."

Section 12 of the Watershed Protection and Flood Prevention Act provides that when the SCS "approves the furnishing of assistance" to a local sponsor to prepare a work plan, the SCS must "notify" the Secretary of the Interior of that approval, to ascertain whether the Secretary "desires" to make "surveys and investigations and prepare a report with recommendations concerning" fish and wildlife resources. Section 12 also provides that Interior can "participate, under arrangements satisfactory" to the SCS, "in the preparation of a plan for work of improve-

ment that is acceptable" to the local sponsors and SCS. The law requires that SCS give "full consideration" to any of the Bureau's recommendations "prior" to the time the local organization and the SCS "have agreed" on a work plan. It also requires that the plan "include such of the technically and economically feasible works of improvement for wildlife purposes recommended" by Interior as are acceptable to, and agreed to by, "the local sponsors" and the SCS. Interior's comments must accompany the work plan submitted to Congress.

It is evident that there are significant differences between these statutes. For example, under both laws, the BSF&W can make studies, investigations and recommendations concerning fish and wildlife resources. But, although the Corps and Bureau of Reclamation have a statutory duty under the Coordination Act to "consult" with the Federal and State fish and wildlife agencies, the SCS has no similar statutory duty. SCS need only give notice to the BSF&W that it has approved an application to prepare a work plan, and give the BSF&W a reasonable time to respond. Then the SCS can proceed without ever getting expert advice from the BSF&W and the State agencies.

Another difference is that section 12 of P.L. 566, but not the Coordination Act, states that works of improvement for wildlife purposes recommended by the BSF&W shall be included in the work plan if they are "technically and economically feasible" and if they are "acceptable to," and "agreed to," by both the SCS and local sponsors. Both Corps and Reclamation Bureau projects also involve the interests of local groups, but the Coordination Act contains no requirement that fish and wildlife conservation measures must be "acceptable" to those interests and be "agreed to" by them. But acceptability and agreement are not easily, if at all, obtained for fish and wildlife measures which are costly to local sponsors and developers, or which reduce the benefit/cost ratio of the project and thus possibly prevent its approval.

A third difference is the "participation" provision of section 12 of P.L. 566. The SCS stresses that this provision gives the BSF&W an opportunity "to participate actively" and the "preparation" of acceptable work plans, i.e., acceptable to the local sponsors and the SCS. Administrator Grant noted that at the Subcommittee's 1971 hearings, as follows: [70]

> Section 12 of the Watershed Protection and Flood Prevention Act (P.L. 83–566) provides for the Secretary of the Interior to make surveys and investigations

[70] Hearings, part 2, p. 532.

> and make recommendations for the conservation and development of wildlife resources within a watershed project, and to participate in formulating the project work plan. Executive Order 10584 of December 18, 1954, as supplemented by Executive Order 10913 of January 18, 1961, prescribes rules and regulations relating to the administration of P.L. 566 and sets forth procedures for notification, coordination, and review among the various federal agencies. Additional guidelines for close interagency coordination throughout the entire planning process are contained in SCS policy memorandums and handbooks. *SCS policy is to give fish and wildlife interest groups every opportunity to particiate actively in these deliberations. Where this participation is achieved, problems generally are resolved to the mutual satisfaction of all concerned.*
>
> To strengthen the above procedures, SCS recently issued new guidelines to provide even closer coordination between SCS biologists and State and Federal fish and game agency personnel. These include coordination in all phases of planning from the initial investigation to plan formulation (Watersheds Memorandum No. 101, January 30, 1970). (Italic supplied.)

The emphasis that Watersheds Memorandum 101 places on "participation" by fish and wildlife agencies in the "development" of work plans is primarily to "assist sponsoring organizations in project formulation." But this emphasis was criticized by the President of the Wildlife Management Institute, Dr. Ira N. Gabrielson, in a letter of October 3, 1969, to SCS Administrator Grant. Dr. Gabrielson said:

> From study and review of many of the small watershed plans which have caused controversy since 1961, we believe a major shortcoming of the program is in failure to communicate with conservation interests until after local watershed sponsors had become committed and politically active in supporting a plan of development containing features unacceptable to conservationists. We realize that many efforts have been made by you, your predecessor and your staff in attempting to remedy this situation and achieve better coordination. *These efforts mainly have been directed to improving coordination by incorporating conservation interest participation in the make-up of the watershed*

> *work planning party, after the watershed application has been approved for planning. When the work planning group begins its studies, SCS has, in effect, already been committed to watershed development although it is conceivable that on a limited number of watersheds, conservation interests may vigorously oppose any developments whatsoever.*
>
> The Institute believes the Secretary should exercise his legal right in disapproving projects or aspects of projects where regional or national environmental resources of consequence will be destroyed or impaired, regardless of a favorable benefit-cost ratio. (Italic supplied.)

Dr. Gabrielson therefore urged that BSF&W and State fish and game agencies make a "statewide review" of project applications "before approval of individual applications for planning."

In his October 14, 1969, reply, Mr. Grant noted that it is SCS policy to "inform" State fish and game agencies and the BSF&W "of its intent to initiate surveys and field investigations to determine feasibility". This, of course, is not consultation.

Mr. Grant seemingly endorsed Dr. Gabrielson's statewide review, but concluded that the "leadership" for such a review should come, not from the SCS, but from the "State agency designated by the Governor to review and approve watershed applications and to recommend watershed priorities." However, it is doubtful that there is much enthusiasm for such review by these agencies.

A fourth difference is money. Section 2(e) of the Coordination Act authorizes the Corps and the Bureau of Reclamation "to transfer" to the BSF&W funds "to conduct all or part" of the required "investigations" of Corps and Reclamation Bureau projects. The House Committee on Appropriations, in its report of June 25, 1973 (H. Rept. 92–327, p. 19) on H.R. 8947—the Public Works Appropriation bill providing funds for the Corps and the Bureau of Reclamation for FY 1974—recommended $1,000,000 "for transfer to the Bureau of Sport Fisheries and Wildlife for * * * essential studies during the coming year. * * *"

But section 12 of P.L. 566 provides no similar authority for transfer of funds. Indeed, the statute quite clearly states that the cost of any survey and investigation initiated by the BSF&W must "be borne by the Secretary of the Interior out of funds appropriated to his Department." But BSF&W funding for this purpose has been sadly lacking. The Bureau's appropriations are

allocated for many other activities in addition to review of channelization projects. The money is spread thin, as Assistant Secretary Reed noted in his 1971 testimony: [70a]

> The Bureau of Sport Fisheries and Wildlife has become greatly overcommitted in recent years under its river basin studies programs. The workload has been increasing at a rapid rate, and the Bureau has not been able to obtain the funds and manpower necessary to keep pace.
>
> In an effort to obtain more adequate funding for that program, the Bureau developed a strong justification early in 1970. This was adopted by the Department of the Interior and issued in May of 1970. This paper was subsequently referred to the Office of Management and Budget on a justification for a higher level of funding.
>
> The long-range funding goal is $11 million by fiscal year 1976. These figures represent the level believed necessary to permit the Bureau to carry out a fully adequate river basin studies program.
>
> Additional increases in funding must be accomplished within the next 5 years if the agencies designing and constructing stream channelization projects are to receive proper input from our agency.

But it appears that Mr. Reed's "goal" will not be achieved. Only in fiscal year 1971 did the administration adopt the funding level recommended by the Assistant Secretary. Indeed, the funding level recommended by the administration for F.Y. 1974 is short of the Assistant Secretary's goal for that fiscal year by $2.3 million. Furthermore, although funding has increased for the BSF&W's river basin studies program, personnel ceilings have not been commensurately increased.

These limitations in the law and in funds have to a considerable degree caused the BSF&W review of SCS projects to be spotty and largely ineffective.

C. THE PROMISE OF THE COORDINATION ACT THAT WILDLIFE RESOURCES BE TREATED EQUALLY IN WATER RESOURCE PROJECTS HAS NOT BEEN FULFILLED AS TO THE CORPS PROJECTS

Congress, in enacting the Coordination Act, ordained that "wildlife conservation shall receive equal consideration" with "other features" of water resource programs. But this promise

[70a] Hearings, pt. 2, p. 412.

has not been fulfilled, largely because the views of the Federal fish and wildlife agencies have often been disregarded.

One example of this problem is the Corps' West Tennessee tributaries project which was authorized in 1948, some 10 years prior to the enactment of the 1958 Coordination Act amendments. According to the Corps, "it provides for the enlargement and realignment"—a euphemism for channelization—"of 210 miles of main stream and tributary channels on the Obion and Forked Deer Rivers." [71] Because the Tennessee Highway Department, which was responsible for providing project right-of-way, had difficulty in obtaining the necessary lands, actual construction began in 1960, 12 years after authorization. About one-third of the project is complete. As noted above, further work on the project has been stopped by court order (*EDF* v. *Froehlke*, supra).

In discussing this project, Major General F. P. Koisch, Director of Civil Works Office of the Chief of Engineers, testified in 1971: [72]

> The environmental issues of the project are a classical example of the conflict in competing use of resources. On the one side, the project will enhance the human environment for inhabitants of the basin through increased crop yields; reduced flood inconveniences, health hazards and damages; and encouragement of a generally higher standard of living. We can anticipate a higher tax base, and consequent improvement in the quality of community service in schools, roads, sewerage systems, and water systems.
>
> On the other hand, the project has accelerated the clearing for agriculture of thousands of acres of woodlands and prime wildlife habitat. If carried to completion, the increased clearing could total about 84,000 acres.
>
> Understandably, conservationists are greatly upset over this. Last year when these concerns became apparent, the district engineer was directed to restudy this aspect of the project.

But, according to the BSF&W, these "concerns" were "apparent," at least to BSF&W and the Tennessee Game and Fish Commission, long before this lawsuit was initiated.

BSF&W's first report on this project was prepared in April

[71] Hearings, part 2, p. 554.
[72] Hearings, part 2, p. 555.

1947, prior to project authorization.[73] Wildlife Biologist Charles E. Crowther, of the Bureau's River Basin Studies Division at Vicksburg, Mississippi, in his May 21, 1970, memorandum to the Field Supervisor, commented on the Corps' response to this report. He said.

> As far as we know, the Corps has paid little, if any, attention to this report. At least, subsequent Corps' project design for drastic and complete channelization of subject streams provide solely for flood control and drainage needs, and contains no features or provisions for fish and wildlife conservation or other water uses or conservation.

The Bureau prepared a second report in December 1959, after enactment of the 1958 Coordination Act amendments,[74] but before initiation of construction. It recommended modification of project design and structural features for water level management for fish and wildlife purposes and the acquisition and initial development of fish and wildlife lands.

The Tennessee project is alined through two State wildlife management areas (the Gooch and Tigret) purchased with the aid of Federal funds. Soon after work began, the Bureau and the Tennessee Game and Fish Commission conducted additional studies and on March 19, 1962, the Bureau commented further to the Corps. Yet despite all these studies and comments, the Corps proceeded with construction of the project without any significant provision for fish and wildlife conservation.

At the Subcommittee's 1973 hearings, Brig. General James L. Kelly, the Corps' Deputy Director of Civil Works, stressed that the Corps is not required by the Coordination Act to include in its projects any recommended fish and wildlife measures. He testified: [75]

> In studying and evaluating alternative solutions to problems with fish and wildlife implications *the Corps has long sought advice and recommendations* from designated agencies and responsible interests. *We have not, however, always agreed with the recommendations made to us.* It is necessary to recall that the Fish and Wildlife Coordination Act *stipulates that the Corps recom-*

[73] The report is entitled "Preliminary Evaluation Report of Fish and Wildlife Resources in Western Tennessee River Basins and Mississippi Backwater Areas, Obion and Hatchie Rivers, Tennessee, Mississippi, and Kentucky."

[74] The report is entitled "A Fish and Wildlife Conservation Plan for the Obion and Forked Deer Rivers Project, Tennessee, A Unit of the Mississippi and Tributaries Review."

[75] Hearings, part 5, p. 2894.

mend only those measures which its reporting officers conclude are justifiable. (Italic supplied.)

Assistant Secretary of the Interior Reed insisted that proper "input" into project design by "knowledgeable professionals in the environmental field is essential," while readily agreeing that the BSF&W's role under the Coordination Act was merely "advisory." But he also criticized the Corps and other Federal water resource development agencies for too often rejecting the recommendations of these "professionals." He said: [76]

> A large portion of the morale problem within my Department is the result of rarely being listened to when we offer relevant recommendations to other agencies on this problem. It is discouraging for our biologists and field personnel to stand by helplessly and watch the wetlands resources succumb to the dredge bit or dragline bucket, with little or no regard for the natural system.
>
> * * * I must tell you, quite frankly, that it has been the observation of the majority of our personnel that those agencies engaged in stream channelization activities are still largely paying nothing more than lip service to earnest environmental protection. We have yet to detect any substantive departure from the practices of yesteryear by these agencies.

The frustrating nature of this long and costly process by which BSF&W continuously makes recommendations with little or no tangible results in described by BSF&W Wildlife Biologist Charles E. Crowther in his May 21, 1970, memorandum to the Bureau's Vicksburg Field Supervisor concerning the Corps' Obion and Forked Deer project. He said:

> In the case of the authorized Obion and Forked Deer project, as with other MR&T projects, the Corps to date may have complied minimally with the letter of the Fish and Wildlife Coordination Act. The Corps has consulted with us, has read our reports and acknowledged them, and has courteously coordinated and consulted occasionally with us. The net result most often has been disappointing, however, in that the action recommended or taken by the Corps respecting fish and wildlife has been negative. No significant concessions were made in original project design toward minimizing the adverse impact of the project on fish and wild-

[76] Hearings, part 2, p. 411–412.

> life. The original project design or plan was never modified in the interest of fish and wildlife. While present review studies are in progress, construction of the authorized project has not been deferred or delayed in the interest of fish and wildlife conservation planning. The treatment given fish and wildlife in project justification studies is inadequate and highly questionable. Fish and wildlife needs have not been given equal treatment to flood control and drainage development needs in the existing project formulation. In fact, *the project has been designed and constructed exactly as would have been the case had we and the Tennessee Game and Fish Commission never reported on fish and wildlife aspects or expressed an opinion. Consequent losses of fish and wildlife resources have been drastic and have exceeded our report projections.* * * *
>
> We can only conclude that the Fish and Wildlife Coordination Act of 1958 has not been effective in its application to the subject project in providing for fish and wildlife conservation and development needs. We think the Act could have and should have been more effective. (Italic supplied.)

The refusal of the Corps and SCS to give greater weight—indeed, to defer—to BSF&W expertise on fish and wildlife matters appears to be contrary to the new national policy expressed in the National Environmental Policy Act of 1969. Thus, the Federal district court in *Sierra Club.* v. *Froehlke,* ——F. Supp. ——5 ERC 1033, 1072, (D., S.D. Tex., February 16, 1973), noted that NEPA required the Corps to consult with agencies with "special expertise" on environmental impacts and ruled that "when a conflict arises between the Corps and an agency which is making an evaluation in its particular field of expertise, and when the Corps' evaluation is based upon factors of which the reviewing agency may take cognizance, then NEPA obligates the Corps in most instances to defer to that evaluation."

The BSF&W also contends that the Corps uses monetary estimates of project losses to fish and wildlife as a limit on project expenditures for mitigation measures despite the objections of fish and wildlife agencies, and, most importantly, despite strong legislative history in opposition to this practice. The Senate Commerce Committee, in its report (S. Rept. 85–1981; July 28, 1958) on the House-passed bill (H.R. 13138) that was finally enacted as the 1958 amendments to the Coordination Act, said (p. 4):

> The legislation would provide that conservation measures for the prevention of losses to fish and wildlife should be included "to the extent justifiable" in authorized projects. It is the understanding of your committee, however, that these measures would not have to be justified under the usual benefit-cost type of analysis. They would not produce "benefits." These measures would be for reducing or compensating for losses.
>
> Similarly, it is the understanding of your committee that the "estimation of wildlife * * * losses" provided for in the bill would not require a dollar evaluation.

Contrary to that clear congressional "understanding," the Corps' regulations emphasize strictly monetary estimates. For example, section 6 of Corps' regulation No. ER 1105–2–105 of December 15, 1972, specifies that, in evaluating project effects, the Corps shall place "values on the significant adverse and beneficial effects in monetary terms where applicable." [77] Another Corps regulation states that the economic value of damages to fish and wildlife resulting from water resource projects will be included as a "cost in project formulation and justification, to the extent that the damages are subject to evaluation in monetary terms." [78] It provides that losses in recreation use through reduced fishing and hunting opportunities must be evaluated by procedures comparable to those used in evaluating benefits; that losses in commercial products must be expressed in monetary terms using the market values to the primary producer of the product; and that nonmonetary damages, "including those impacts affecting the eco-system and environmental quality," must be described in "sufficient detail to support a judgment as to the cost that would be justified to prevent or offset them." The regulation then clinches the subject by stating that "compensatory measures" will be included, "unless they are judged [by the Corps] to be exorbitantly expensive."

The BSF&W, in a January 16, 1972, letter replying to a General Accounting Office inquiry, explained why it does not want to place monetary values on fish and wildlife losses:

> As a matter of policy, we have avoided placing a monetary value on fish and wildlife losses. To do so would provide the construction agencies with a convenient

[77] The regulation is entitled "Guidelines for Assessment of Economic, Social, and Environmental Effects of Civil Works Projects." It has not been published in the Federal Register.

[78] No. ER 1120–2–401, August 14, 1970. The regulation is entitled "Investigation, Planning and Development of Water Resources Preservation and Enhancement of Fish and Wildlife Resources." It has not been published in the Federal Register.

means to mathematically deduct losses from benefits in adjusting the project b/c ratio in lieu of accomplishing mitigation. We have based our recommendations on replacement of habitat in kind to the extent possible.

D. THE BUREAU OF SPORT FISHERIES AND WILDLIFE HAS SOMETIMES BEEN STYMIED BY ITS PARENT AGENCY, THE INTERIOR DEPARTMENT, AND NEGOTIATED COMPROMISES THAT LATER TURNED SOUR

The experiences of the BSF&W with the SCS under section 12 of the Watershed Protection and Flood Prevention Act have been frustrating. But they have been compounded by the Bureau's parent agency, the Interior Department.

For example, the Alcovy River watershed project in Georgia began in November 1960, with the formation of the Alcovy River Watershed Association and the filing of an application for assistance with the Georgia State Soil and Water Conservation Committee. According to a Januray 31, 1972 summary report on this project, in the summer of 1966 the State committee and the SCS State Conservationist "jointly selected" this watershed for planning, and preliminary study. The study "indicated that a watershed project was feasible" and assistance for developing a work plan "was formally authorized in July 1967."

On August 30, 1968, the State fish and wildlife agency and the BSF&W objected to the SCS's "tentative" channelization plan for the Alcovy watershed. Despite this, a work plan was completed in October 1968 and a public hearing was held in February 1969, at which time the Georgia Game and Fish Commission opposed the channel measures and requested a meeting with SCS to "resolve" their objections.

In an August 6, 1969, letter to then Secretary of Agriculture Clifford M. Hardin, Assistant Secretary of the Interior James R. Smith recommended "re-evaluation" of the project "to eliminate that portion of planned stream channel alterations below the downstream impoundments along those reaches in which natural resources would be significantly damaged or destroyed." [79]

On August 28, 1969, SCS Administrator Grant agreed to a reevaluation to determine:

(1) Those areas which the Bureau of Sport Fisheries and Wildlife and Georgia Game and Fish Commission believe must be preserved.

(2) Necessary modifications of the project plans to accomplish such preservation.

[79] Hearings, part 3, p. 1914.

(3) The effect of such modifications on the feasibility of the plans particularly on the level of flood protection and benefit-cost ratios.

(4) The acceptability of such modifications to concerned interests, particularly the sponsoring local organizations.

This reevaluation was completed in August 1970, and on August 25 the SCS transmitted to the BSF&W and the State "another" draft of a proposed work plan which eliminated some channelization. But the SCS State Conservationist, Mr. C. W. Chapman, emphasized: [80]

> As you know, these proposed changes have not been discussed with the sponsors. We cannot make changes in the plan without their concurrence. For this reason, we hope you will join us at the time we meet with the sponsors with the thought that our mutual recommendations may be more fully explained and result in a more comprehensive plan for the Alcovy Watershed.

On December 31, 1970, the Georgia State Game and Fish Commission said: [81]

> Our original concern, of course, in this project was the loss of fish and wildlife and environmental values. Originally we requested that stream channelization be eliminated in the sections of the streams below the downstream flood retarding structures. During the past year, we have worked toward that point with your agency and with personnel from Sport Fisheries and Wildlife and have gradually reduced the downstream channelization from 43.8 miles to 16.1 miles as listed in your present proposal. We had hoped that the entire channelization below these structures could have been eliminated; however, after the many sessions we have had with your personnel, it is evident that this will not be done. Therefore as the project is now proposed, there will be a net loss of fish and wildlife values and we, therefore, cannot endorse the project.

Interior's reply of February 2, 1971, was similar to that of the State Commission. But Interior's spokesman, Clarence S. Lorentzson, added a comment which is of considerable importance to this entire controversy. He said: [82]

> As you are undoubtedly aware, this Department has become increasingly disturbed over the number of proj-

[80] Hearings, part 3, p. 1915.
[81] Hearings, part 3, p. 1932.
[82] Hearings, part 3, p. 1936.

> ects being planned and carried out which involve extensive alteration of streams. If the emphasis on this practice continues, the result will be the ultimate destruction or serious degradation of irreplaceable and valuable public resources, including fish and wildlife, associated with many bottom lands and rivers. Project proposals for the Alcovy River basin characterize our concern. The Alcovy proposals include a multimillion dollar flood control program to "benefit" a relatively undeveloped wooded flood plain, with only 15 percent of the area in agricultural production. Project information available in our files of 75 Georgia watershed projects in various stages of planning and/or installation reveals that 97 percent of these projects include stream channel alteration totaling over 2,000 miles. We support sound water management practices; however, we believe that the public interest is not served in instances where strictly localized flood control benefits from stream channel alteration are achieved at the expense of extensive damages to natural resources of broad public value.

After a meeting with Interior Secretary Morton on July 16, 1971, Agriculture Secretary Hardin agreed to a further study and a second reevaluation of the project. But, in reaching this agreement, both secretaries emphasized that this reevaluation was to start with the "assumption" that there was a "valid" need for the project.[83] Thus, despite the concern expressed by Mr. Lorentzson about the channelization planned for the Alcovy, the Department refused to question the project itself. Guidelines for this "reevaluation" were completed in September 1971 and a study team was established.

When the Subcommittee questioned the two Federal agencies about this restriction on the study, Interior replied vaguely that this was the decision of the two secretaries.[84] The SCS stated bluntly that: [85]

> Public Law 83–566, section 3, authorizes the Secretary of Agriculture, if the Governor of the State or his designated agency has not disapproved the application of local people for assistance within 45 days of its receipt, to assist the local people prepare a plan to alleviate their water and related land resource problems.

[83] Hearings, part 5, p. 2801.
[84] Hearings, part 5, p. 2819.
[85] Hearings, part 5, p. 2860.

> *The needs for such a plan had been determined and a proposed plan had been developed.* The questions raised concerned environmental impact, and possible alternatives to proposed works of improvement, not the need for a plan. This question, therefore, was not one for the study team to consider. The reevaluation requested by the Secretary of the Interior was for the purpose of eliminating that "portion of planned stream channel alterations below the downstream impoundments along those reaches in which natural resources would be significantly damaged or destroyed. (Italic supplied.)

The study team prepared a summary report in January 1972 stating: [86]

> The scope of Interior's participation in this reevaluation effort was concentrated primarily in the recreation, fish and wildlife fields. *Interior's efforts in the economic, engineering and hydrology fields were limited to a rather cursory review of existing data collected and developed by SCS and routed through SCS procedures and methodology to reach the conclusions. In accordance with the agreement between the two Secretaries in this reevaluation, no attempts were made by Interior participants to collect or reformulate basic data which would lead to a total reevaluation of the economic and engineering aspects of the basic watershed project.* (Italic supplied.)

As the study team noted, Interior's "efforts * * * in the economic, engineering and hydrology fields" were indeed "rather cursory." In his February 25, 1972, review of the hydrology and sedimentation section of the proposed Alcovy project reevaluation report, the District Chief of the Geological Survey, Mr. John R. George, noted that the Interior Work Group "questioned" economic values placed upon certain hydrology and sedimentation items. He said:

> In one example, we were unable to determine how an annual flood damage reduction benefit of $22,410 (over 40 percent of the total annual damage reduction benefits) was derived for reduction in road bank erosion. The method of transformation of these data was

[86] The SCS reproduced only 75 copies of this January 1972 summary which were "distributed" to Interior, the State fish and game agency, and itself, but not made public. Interior explained (hearings, part 5, p. 2819) that the SCS "requested" that these few copies be "held within the respective agencies pending release of draft and final work plans and environmental impact statements."

not privy to the hydrology and sedimentation work group.

The Assistant Director of the State fish and game agency, Mr. Jack A. Crockford, also noted several shortcomings in this section of the report in an April 10, 1972, letter to Interior's Deputy Under Secretary, Mr. Frank E. Clarke. The Interior Field Team Leader, an employee of BSF&W, in a May 22, 1972, memorandum, commented on this letter as follows:

> In responding to Mr. Crockford, Deputy Under Secretary Clarke stated in his letter of April 18, 1972, * * * that the hydraulic and economic questions mentioned were being reexamined in preparation of the final report. Unfortunately, this was not quite the case. During the early phase of this reevaluation effort the Secretary's Office elected not to make an in-depth economic analysis of the SCS proposal. In addition, the revising or editing of the recommendations * * * of the summary report, as per [former Interior Under Secretary] Pecora's instructions, did not involve further analysis or studies by the various work groups.

When this Subcommittee, in March 1973, asked the Agriculture and Interior Departments about this second restriction on the study, the SCS replied: [87]

> The study team was instructed to utilize to the fullest extent the data already collected and developed. The USGS member of the team reviewed the hydrologic data used in project evaluation and found it fully acceptable. The Department of the Interior had one of its top water resources economists review the economic data and evaluations. His findings were: "In conclusion, therefore, it is evident that the economic analysis of the SCS watershed work plan for the Alcovy River (watershed) has been undertaken in a satisfactory manner within the economic evaluation system prescribed by the President's letter of May 15, 1962, and described in Senate Document No. 97, 87th Congress, 2d session and further endorsed by the guidelines and directives of the Water Resources Council."
>
> The engineering structural designs and cost estimates were carefully reviewed by SCS engineers for adequacy. The duplication in detail of all investigations and analyses made by SCS was not considered to be needed.

[87] Hearings, part 5, p. 2860.

The SCS has been unable to predict when the next version of the Alcovy watershed work plan would be available for public review and comment. One thing is quite evident. A great deal of time and money has been spent by the Government to remodel this project without questioning the basic assumptions for its existence, namely, the need for it and its economic viability. In reality, the "reevaluation" by Interior and Agriculture was only partially done—because the need "had been determined and a proposed plan had been developed."

The BSF&W has been hamstrung by the fact that, in many instances, its superiors in the Interior Department have failed to support efforts to seek more than project modifications which limit, but do not eliminate, damage and destruction of wildlife resources.

This may explain why in some instances, such as the Starkweather project in the Dakotas and the Cameron Creole project in Louisiana, the BSF&W professionals have negotiated half-a-loaf compromises, only to learn later that such compromises are of dubious value.

In some instances, however, such as the Wild Rice Creek project in the Dakotas, the BSF&W simply failed to do its job properly. Thus, BSF&W told the SCS on July 1, 1957, that its reconnaissance review of the proposed project "Indicates that fish and wildlife resources generally will be benefited" by the "measures contemplated"; that there would be substantial public fishing benefits; and that the project "would have no substantial effect" on a wildlife refuge.[88] Later, in August 1965, after the structural measures were virtually completed, the BSF&W prepared a special report containing the notation "For administrative use only; not for public release." That report states that public fishing benefits have not resulted although some fishing for one "landowner and his friends" was provided; that the "lack of public access has hindered full use" of one structure; and that the general conclusion of 1957 that fish and wildlife would benefit from the project proved to be "greatly in error." [89]

E. THE SCS HAS GENERALLY BEEN COOL TOWARD THE FISH AND WILDLIFE AGENCIES' ROLE IN SCS PROJECTS

At hearings in July 1971 before the Senate Committee on Public Works, Administrator Grant complained: [90]

> There are no directives to require that a conservation

[88] Hearing, part 4, p. 2593.
[89] Hearings, part 4, pp. 2597–2598.
[90] Hearings, Senate Committee on Public Works, p. 111, footnote 37, *supra*.

> district tailor its plan to meet the complaint of a State or national fish and wildlife agency. The sponsors have the right and the responsibility to decide what measures are included in their projects. Our experience has shown that in a predominance of cases neither the State or the national wildlife agency has had enough interest in the project to sit with the sponsors and discuss the project objectives and the problems which the sponsors face. In many instances, therefore, the complaints of these agencies are made without any knowledge of the project as a whole. Joint participation at the plan formulation table is the only way these issues can be resolved. Until the fish and wildlife agencies participate at that level with documented facts about the values in the project, the conservation districts will accept the suggestions which are not contrary to their objectives and which they can finance. Other suggestions they are likely to reject. In case of disagreement the Soil Conservation Service determines the significance of the biological impacts in comparison to the project objectives. If biological losses are significant and a reasonable solution for reducing them is available, the SCS withholds assistance until the necessary measures to reduce excess biological damages are included in the work plan.

The BSF&W has a statutory obligation to give the Corps, the Bureau of Reclamation, the SCS, and the public its best possible professional advice and recommendations. To the maximum extent feasible, it should, of course, seek the views of the public, including the local sponsors of the project. But it is not obligated, as Administrator Grant suggested, "to sit with the sponsors" and "discuss" the project objectives, under pain of having its recommendations rejected. Such a burden, when multiplied by all the projects the BSF&W must review, would make BSF&W's reviews highly inefficient and quite impractical.

SCS's disdainful attitude toward the fish and wildlife agencies' recommendations is also shown by the fact, as SCS Administrator Grant acknowledged at this Committee's 1971 hearings, that the SCS had stopped only one project—the Alcovy in Georgia—"as a result of a direct request" from the Interior Department. Some, however, have been modified.[91]

Even more revealing has been SCS's response to BSF&W's

[91] Hearings, part 2, pp. 547, 548.

guidelines, developed in January 1972, entitled "Policy and Guidelines For the Planning and Review of Stream Channel Alteration Projects." [92]

These guidelines note that many environmentally destructive SCS and Corps projects are being planned and constructed, and warn that if this "continues, the ultimate result will be the serious degradation of these valuable and irreplaceable natural resources throughout the Nation." The guidelines set forth BSF&W's general policy concerning water resource projects and state that BSF&W "cannot support or condone" projects "which would damage environmental resources but have only localized, mainly private benefits to a relatively few people."

When the Interior Department transmitted the guidelines to the Agriculture Department in December 1972, the responses by the Secretary of Agriculture and SCS were hostile and critical. Secretary of Agriculture Butz said, in a January 11, 1973 letter, that the BSF&W guidelines "(a) reflect an overly narrow view of the situation, maximizing fish and wildlife values with inadequate recognition of human resource values and needs; (b) reveal a lack of appreciation of the agricultural and rural development missions of this Department; and (c) establish conditions for Bureau approval or opposition over and above those contained in the small watershed and farm program acts." SCS Administrator Grant's letter of March 5, 1973, described the BSF&W guidelines as "essentially negative" and "criteria for opposing all channel work." [93]

In his letter of March 5, 1973, SCS Administrator Grant suggested that a "task force" of SCS and BSF&W specialists be established to "explore the possibility" of either "modifying" the guidelines or developing a channel planning and design manual "we can both support." [94] However, the differences between the SCS's attitudes and those of the Interior Department and environmental groups apparently remain sharply drawn.

Mr. Thomas Barlow of the Natural Resources Defense Council, who testified at the Committee's 1973 hearings, wrote to the Interior Department on April 5, 1973, criticizing Administrator Grant's task force proposal, as follows: [95]

> In short, perhaps at some future date a joint study team to analyze the problem of channelization might be

[92] These guidelines were published in the committee's hearings, part 5, p. 3279, but have not yet been published in the Federal Register as required by 5 U.S.C. 552(a) (1) (D) and (E).

[93] Hearings, part 5, pp. 3282–3284.

[94] Hearings, part 5, p. 3282.

[95] Hearings, part 5, p. 3288.

> in order. However, it is evident that citizen pressure has not yet brought the SCS to the point where it will provide competent and comprehensive answers to many of the serious questions raised by these ditching programs, much less meaningful remedies for the environmental destruction which they cause. The SCS's failures to respond to the impact statement provisions of NEPA are clear evidence of their recalcitrance in this regard.
>
> We feel that if and when such a study team were to be assembled, it should include representatives from other Federal and State agencies with responsibilities for the environmental resources which these channelization programs impact as well as representatives of the concerned public. At this time, we feel very strongly that the motives of the SCS in proposing this particular approach study smack of salami tactics in that only fish and wildlife problems would be assessed (and other impacts presumably ignored) and, therefore, that the SCS's designs are of a co-optive rather than a cooperative nature. We, therefore, support a vigorous application of your Department's channelization guidelines by your field offices.

The task force has not yet been established and Assistant Secretary of the Interior Reed informed the Committee that the Department plans to keep the guidelines "in effect." [96]

The Committee questions both the need for and the usefulness of such a task force. The guidelines are useful. They are not as negative as the SCS suggests. They are consistent with existing statutory authorities, and, most importantly, they stress the need for a case-by-case review of channelization projects. They do not condemn all such projects, but simply require proof that the project is environmentally sound.

The SCS's rejection of that point of view was pithily summarized by an Interior Department official in Atlanta who told a Wall Street Journal reporter: "The SCS frequently doesn't pay any attention to what they're told either by us or by other environmental groups. They listen, of course, because they're bound to by law, but then they go right ahead with their previous plans." [97]

It is obvious that the various limitations in statutory authority and the differences in interpretation that have emerged

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[96] Hearings, part 5, p. 2947.

[97] Senate hearings, *supra*, p. 4, footnote 37.

since 1958 will not be resolved by the agencies involved. Each has its own position. Each appears to resist accommodation. The Committee believes that only Congress can resolve these problems through amendment of the Coordination Act.

The Committee therefore recommends as follows:

The appropriate committee of the House of Representatives should consider amending the Fish and Wildlife Coordination Act to (a) extend it to all water resource projects constructed or financed by a Federal agency, (b) insure that Federal and State fish and wildlife agencies are notified at an early stage in project development, (c) require that Federal water resource agencies set forth their reasons for not including in the project any fish and wildlife mitigation and enhancement features recommended by Federal or State fish and wildlife agencies, and (d) require that estimates of fish and wildlife losses not be evaluated solely in monetary terms.

VII. CHANNELIZATION MAY OFTEN ADVERSELY AFFECT WATER QUALITY, BUT THE SCS HAS CONTENDED HAT IT NEED NOT ACCEPT THE ENVIRONMENTAL PROTECTION AGENCY'S WATER QUALITY RECOMMENDATIONS, UNLESS DIRECTED BY CONGRESS OR THE PRESIDENT. THE FEDERAL WATER POLLUTION CONTROL ACT OF 1972 SPECIFIED THAT A PRESIDENTIAL ORDER SHALL BE PROMULGATED BY MID-APRIL 1973 REQUIRING FEDERAL AGENCIES, IN EXERCISING CONTRACT, GRANT OR LOAN AUTHORITY, TO EFFECTUATE THE PURPOSES OF THE ACT

At the Subcommittee's March 1973 hearings, Dr. Stanley M. Greenfield, EPA's Assistant Administrator for Research and Monitoring, testified that channelization is "a major factor in causing the deterioration of water quality through its role in increasing sedimentation, eutrophication, and the accumulation of pollutants such as pesticides." [98] He went on to say: [99]

> * * * channelization increases the quantity of nutrients and other pollutants in the water. Two phenomena work in concert to achieve this: (1) additional runoff caused by channelization allows these substances to enter the water in greater amounts where they are often absorbed and transported downstream by fine grained sediment particles; and (2) channelization's often induced

[98] Hearings, part 5, p. 2901.
[99] Hearings, part 5, p. 2902.

> secondary effect of bringing adjacent lands under agricultural development provides greater quantities of nutrients and pesticides for eventual entry into the waterway. In several channelization projects blue-green algae, indicative of high-nutrient loading and eutrophication, have been found. It should be noted that this secondary effect of bringing adjacent land under development generally signals an end to the wetlands that are nurtured by the stream.

The SCS, however, apparently disagrees with Dr. Greenfield's view that channelization is a "major factor" adversely affecting water quality. In response to the Committee's inquiry on this matter, the SCS stated as follows: [100]

> Channel improvement decreases eutrophication of surface waters. Eutrophication problems are most evident in ponded, slow-moving streams which enhance nutrient uptake by algae and aquatic vegetation. Channel improvement facilitates transport of dissolved nutrients downstream and ultimately to the ocean where they are needed to sustain various forms of marine life. Sediment often carries absorbed phosphorus into streams. It should be noted that nutrient rich topsoil and organic matter carries more nutrients—particularly phosphorus than subsoil. For this reason sediment from streambanks poses less threat to increased eutrophication than that from sheet erosion of more fertile surface soils within the contributing watershed. Studies at the USDA Sedimentation Laboratory at Oxford, Miss., show that sediment with low phosphorous content from Memphis soil, for example, has the capacity to adsorb phosphorus from nutrient rich water. * * * Channel improvement will have little effect on pesticide content of channel flow as sediment from channels and streambanks are not prime carriers of pesticides.
>
> Sedimentation, eutrophication, and pesticide problems in surface waters are reduced through use of sound land treatment measures within watersheds contributing to streams. Channel improvements tend to further reduce such problems.

When asked if he agreed with the SCS comments, Dr. Greenfield testified as follows: [101]

[100] Hearings, part 5, p. 2852.
[101] Hearings, part 5, p. 2948.

> Dr. GREENFIELD. No. Once again, there may be cases where this occurs. But, in general, I think what you are doing is just moving the problem downstream because, obviously, what you have done in the channelization is increased the velocity and increased the ability of the stream to carry various substances. But, as soon as the velocity decreases, as when the stream enters a larger lake or what have you, then the stream drops the substances at that point and you start to increase sedimentation and siltation. You have just transferred that whole nutrient enrichment problem, along with sedimentation, downstream to where it settles out.

The Committee leaves the technical debate to the water quality experts, biologists, hydrologists, and engineers. Rather, the Committee's concern is whether EPA's expertise and advice are being sought and heeded by the SCS.

When EPA's Assistant Administrator for Field Coordination, Donald M. Mosiman, testified at the subcommittee's June 1971 hearings, he stated that EPA did make recommendations on "water quality management features to SCS for inclusion in such projects for the protection and maintenance of water quality." However, he added: [102]

> Mr. MOSIMAN. They have not accepted them in all instances. It has depended upon the nature of the project and the nature of the recommendations we made. Mr. Erickson [of EPA] has advised me that we have had some coordinated field studies as a result of projects which had been proposed and which we had reviewed and which ultimately had been constructed, and that in many instances there were problems and the problems could be directly traced to their not having taken into full consideration some of the recommendations that we had made to them in our review process.

SCS's aloofness seems to have easily discouraged EPA's follow-up, as indicated by Mr. Mosiman's letter of June 23, 1971 to the Committee, in which he stated that he could not provide details "of noncompliance on specific recommendations made to SCS," primarily because "no monitoring system that would show compliance or noncompliance with our recommendations has been established." [103] The Subcommittee's March 1973 hearings showed

[102] Hearings, part 2, p. 501.
[103] Hearings, part 2, p. 501.

that EPA's monitoring capabilities have not improved,[104] and that SCS accepts EPA's recommendations only if "the sponsoring organization agrees to the added provisions." SCS proceeds with the project so long as "any remaining adverse [water quality] effects are acceptable in view of the countervailing benefits." [105]

Thus, the SCS believes that recommendations on water quality, like recommendations on fish and wildlife, need be adopted only where both the SCS and the local sponsors are in agreement that they are technically and economically feasible.[106]

Our Nation is spending billions of dollars to halt the pollution of our waterways. Much of our efforts have been directed at municipal and industrial dischargers, recreational vessels, and Federal facilities, such as defense installations. Yet, quite inconsistently, little has been done to insure that water resource projects financed or constructed by the Government which may potentially degrade our waters should include measures to prevent such degradation.

The need to deal with the latter problem was recognized by President Johnson in Executive Order 11288 of July 2, 1966 (3 CFR, 1966–1970 comp., 559). That order contained provisions (a) authorizing agencies which make loans, grants or contracts (as SCS does) to issue regulations to reduce and prevent water pollution from its activities, and (b) requiring such agencies to seek technical advice from the then Federal Water Pollution Control Administration (which later was merged into EPA). Thus, under the 1966 order, the SCS had the opportunity, had it so desired, to develop and promulgate regulations to insure that its projects would not increase the pollution of our waterways. But the SCS never promulgated such regulations. Although SCS's Watersheds Memorandum 89 of July 10, 1968 directed that SCS personnel "engaged in watershed and river basin planning should become generally familiar with the effects of the various pollutants on water quality," Memorandum 89 did not mention the 1966 directive to seek "technical advice" on water quality from the FWPCA.

It is indeed, significantly symbolic that SCS, in August 1967, designated one chapter in its Watershed Protection Handbook for "Water Quality Management," but to this day the chapter is bare and blank, and no instructional material has yet been issued.

Executive Order 11288 was superseded on February 4, 1970, by

[104] Hearings, part 5, p. 2347.
[105] Hearings, part 5, p. 2871.
[106] Hearings (Sen.), *supra*, footnote 37, p. 111.

Executive Order 11507 (3 CFR, 1966–1970 comp., 889). The 1970 order, like the 1966 order, directed "that the Federal Government in the design, operation, and maintenance of its facilities shall provide leadership" in protecting and enhancing water quality. However, the 1970 order omitted the provision of the 1966 order concerning prevention of pollution by agencies in the exercise of their loan, grant and contract authority. According to EPA's witness, Mr. Mosiman, EPA does not "carry out a review under Executive Order 11507" of SCS projects, because the "SCS has taken the position" that such projects are "locally initiated non-Federal projects, rather than Federal water resources projects." Hence, said Mr. Mosiman, "SCS does not feel that its projects fall within the jurisdiction of section 7 of Executive Order 11507 and does not feel compelled to accept our comments and recommendations under Executive Order 11507. We do review and comment on SCS projects, however, and our comments are accepted in many cases." [107]

According to Mr. Mosiman, Executive Order 11507 omitted the provisions of the 1966 order concerning anti-pollution action under loans, grants, and contracts "in favor of a broad study by the executive branch of Federal procurement which would be followed by the preparation of a separate Executive order." [108] In August 1970, the House Government Operations Committee recommended that this omission be rectified by issuance of a new Executive order on combating pollution in activities financed by Federal loans, grants or contracts.[109] Subsequently, in June 1971, EPA issued a report which recommended the issuance of a new Executive order covering these matters.[110] But neither recommendation has produced further action by the executive branch.

While awaiting the development of a new Executive order, EPA hoped that an "adequate system for monitoring SCS projects" could be established. It suggested that "an initial step in this direction" might be an interagency agreement "which would provide for EPA advice and consultation on watershed projects, assure acceptance of water quality recommendations and establish a continuing monitoring program to assure that water quality goals are being met." [111] However, SCS Administrator Grant

[107] Hearings, part 2, p. 504.

[108] Hearings, part 2, p. 505.

[109] H. Rept. 91–1433 of Aug. 19, 1970, entitled "Protecting America's Estuaries: The San Francisco Bay and Delta," p. 56.

[110] The report entitled "Task Force on Federal Facilities and Federal Procurement" dated June 22, 1971, together with a related White House report of July 1970 entitled "Report of Control of Environmental Abuses Associated with Federal Procurement Activities," are printed in hearings, part 4, pp. 2265–2590.

[111] Hearings, part 2, p. 504.

informed this Committee on August 20, 1971, that EPA "had not contacted" the SCS about such an agreement, that he doubted the "need for such an agreement," that a very "close and congenial relationship exists between" the SCS and EPA, and that if conditions "should develop" which would make such an agreement "desirable," the SCS "will welcome the opportunity to cooperate with EPA in this manner."

At the Committee's 1973 hearings, EPA stated that it's "principal involvement with channelization" of the SCS and other agencies is through its review of environmental impact statements.[112] But such review is obviously quite unsatisfactory because, as noted later in this report, the SCS does not prepare an environmental impact statement on many of its projects. Even when SCS prepares an impact statement, which EPA reviews under section 309 of the Clean Air Act (42 U.S.C. 1857h–7), to determine whether the proposed project "is unsatisfactory from the standpoint of public health or welfare or environmental quality," EPA can only comment, publish its comment, and refer the matter to the Council on Environmental Quality. But there the matter can die. CEQ has no authority to require the SCS to halt the project or to accept EPA's recommendations. Its only weapons are persuasion and public opinion. Indeed, EPA has been timid about referring any matter to the CEQ under section 309(b), and has not done so to date. Even though EPA declared, on February 5, 1973, that SCS's Starkweather watershed project in North Dakota is "unsatisfactory because of its potentially harmful effect on the environment," EPA did not refer the project to the CEQ.

Also, EPA's performance is commenting on environmental impact statements is often quite inadequate. For example, in the *Chicod Creek* case, the court in February 1973 criticized SCS's final impact statement for ignoring the adverse effect of eutrophication on water quality. Yet EPA, in its May 17, 1972, comment on the SCS draft statement, had not mentioned eutrophication and merely "questioned" an SCS comment that "downstream pollution will be reduced" by the project.

This gap in the battle against water pollution was addressed in the comprehensive amendments to the Federal Water Pollution Control Act which Congress enacted over the President's veto on October 18, 1972 (Public Law 92–500). Section 508(c) directs that the President "shall cause to be issued an order" within 180 days after October 18, 1972, "(1) requiring each Federal

[112] Hearings, part 5, p. 2846.

agency authorized to enter into contracts, and each Federal agency which is empowered to extend Federal assistance by way of grant, loan, or contract to effectuate the purpose and policy of this Act in such contracting or assistance activities, and (2) setting forth procedures, sanctions, penalties, and such other provisions, as the President determines necessary to carry out such requirement."

This subsection would enable SCS to develop and enforce water quality requirements for SCS projects consonant with the Act, and enable EPA to review and advise SCS on water quality matters.

The required presidential order was not issued, however, within the 180 days prescribed by law. Some 2 months later, the Subcommittee learned that EPA was preparing a draft which, either deliberately or in ignorance of this Committee's 1970 recommendation, was apparently going to pass over the water quality problems associated with Federal assistance programs. As drafted, the proposed presidential order provided no opportunity to mandate that SCS develop and promulgate minimal water quality requirements for its small watershed program, or for EPA and State water quality agencies to review SCS projects and advise the SCS concerning their effect on water quality. Therefore, on July 6, 1973, Subcommittee Chairman Reuss wrote to the Director of the Office of Management and Budget, Mr. Roy L. Ash, requesting that the proposed order be revised. He urged that it be particularly framed to specify the principal criteria that SCS and other grant, loan, and contract agencies should follow to "effectuate" the purposes and policy of the Federal Water Pollution Control Act, and that OMB promptly approve it for Presidential issuance.

Six weeks later, on August 22, OMB's Deputy Director, Mr. Frederic V. Malek, replied that since the proposed order was nearly ready for promulgation when OMB received the Subcommittee's letter, OMB did not want to delay it "for exploration of the issue raised" by Chairman Reuss. No assurances were offered that the issue would be "explored" and the order revised at a later date.

Subcommittee Chairman Reuss responded to Mr. Malek on August 28, 1973, that the "issue" raised by the Subcommittee on July 6 was not a new one and that both this Committee and an EPA task force had studied the matter and concluded that Executive Order 11507 was deficient, because it did not apply to the SCS program. The Chairman added:

> Now, after our Subcommittee has raised an important substantive issue concerning the scope of the order, OMB is suddenly rushing to have it promulgated.
>
> We think such haste now does a disservice to the President and certainly to the public. * * * We request that OMB and EPA take the time needed to revise the draft order to comply with the statute.

On August 23, EPA's Acting Administrator, Mr. John R. Quarles, Jr., advised the Subcommittee that the proposed order would be issued in "approximately" 10 days. He also said that section 508(c) of the FWPCA does not apply to the SCS small watershed program, and that it should not be "made applicable to stream channelization."

In discussing whether section 508(c) applies to the small watershed program, Mr. Quarles said that EPA is "constrained" by the "legislative history of Section 508," and that this history "limits" the scope of the section "to facilities to be utilized in Federal contracts, grants, and loans." He also mentioned that this history is "consistent" with the comparable section 306(c) of the Clean Air Act. He then said: "I do not believe that section 508(c) * * * should be made applicable to stream channelizations."

But Mr. Quarles did not identify what "legislative history" he relied on. When the Subcommittee staff inquired about this, an EPA representative admitted that no such "legislative history" exists.

The statute itself is quite sweeping. It mandates issuance of a presidential order "requiring each Federal agency *which is empowered to extend Federal assistance* [*to anyone*] *by way of grant* * * * *to effectuate the purpose and policy*" of the Act. (Italic supplied.) These are not words which "limit" the scope of the section, as Mr. Quarles suggests. Furthermore, there is nothing in section 508(c) which directly or indirectly "limits the scope" of the provision "to facilities to be utilized in Federal contracts, grants, and loans."

Indeed, the very structure of section 508 is contrary to Mr. Quarles' statement.

Subsection (a) of section 508, which is directed to Federal agencies, not the President or EPA, prohibits such agencies from awarding procurement contracts to anyone convicted under section 309(c) of the FWPC Act (which relates to violations of several sections of the law) if the contract is to be performed at a "facility" at which occurred the violation leading to the

conviction. The subsection is self-operating. No Executive order is required to implement it.

But subsection (c) of the same section 508 is directed to the President and is not self-operating. It provides that a Presidential order be issued "requiring" *every* Federal agency which extends "assistance by way of grant, loan, or contract" to "effectuate" the purposes and policies of Public Law 92–500. It specifies that the order shall set forth its own "sanctions, penalties and such other provisions, as the President determines necessary to carry out such requirement." Contrary to Mr. Quarles' contention, the term "facility" is not used in this subsection. If Congress had wanted to limit subsection (c) to "facilities," it could have done so, just as it did in subsection (a). But it did not so limit subsection (c). Instead, Congress wrote it so plainly that no "legislative history" could transform its congressional purpose into the narrow framework the statement suggests.

Similarly, the legislative history of the almost identical section 306(c) of the Clean Air Amendments of 1970 (Public Law 91–604; 42 U.S.C. 1857h–4) indicates that Congress did not intend that the terms and penalties of subsection (a), relating to procurement contracts held by convicted persons for work at a facility, shall govern or restrict the separate requirements of subsection (c), which applies to grants, loans, and contracts extending "Federal assistance" to anyone. (See conference report (H. Rept. 91–1783, pp. 56, 57) on H.R. 17255, which became the Clean Air Amendments of 1970.)

In his August 28 letter to EPA, Subcommittee Chairman Reuss once again urged that the proposed Executive order be revised. He said:

> We recognize that a revision of the draft order to encompass this matter will entail some additional delay in promulgating the order. But since it has been delayed up to now, a further delay for a substantive matter such as this is not only warranted, but essential, to insure compliance with the law.
>
> It has been suggested to us, as a matter of policy, the Administration may not want to revise the order to cover the channelization matter. We hope that this is not the case, particularly after two EPA witnesses have testified at our channelization hearings that the SCS has not readily accepted EPA's advice and recommendations on water quality matters. We note that when faced with this problem under the Refuse Act program, the President issued an Executive order (No. 11574, Decem-

> ber 23, 1970) requiring that the Corps of Engineers accept EPA's "advice" on such matters. We think a similar approach is desirable under section 508(c) of Public Law 92–500, and would be consistent with the purpose of that law that EPA be the Government's principal agency on water quality matters.

The OMB and EPA, however, apparently believed that expediency is more important than substance, because on September 10, 1973, nearly six months after the 180 days prescribed by law, President Nixon signed Executive Order 11738 (38 F.R. 25161).

The new order merely incorporates water pollution matters with the air pollution matters previously covered by the superseded Executive Order 11602 of June 29, 1971 (36 F.R. 12475; 3 CFR 328). As the Subcommittee feared, the new order does not appear to provide any means by which Federal agencies, such as the SCS, will have to seek and heed EPA advice on water quality matters. Indeed, the only section of the new Executive order which has even a remote relationship to the water quality aspects of SCS projects is the following:

> SEC. 4. *Procurement, Grant, and Loan Regulations.* The Federal Procurement Regulations, the Armed Services Procurement Regulations, and, to the extent necessary, any supplemental or comparable regulations issued by any agency of the Executive Branch shall, following consultation with the [EPA] Administrator, be amended to require, as a condition of entering into, renewing, or extending any contract for the procurement of goods, materials, or services or extending any assistance by way of grant, loan, or contract, inclusion of a provision requiring compliance with the Air Act, the Water Act, and standards issued pursuant thereto in the facilities in which the contract is to be performed, or which are involved in the activity or program to receive assistance.

But this section, like the similar section in the 1971 order (E.O. 11602), refers only to "facilities * * * which are involved" in the grant or loan program. The 1971 order delegated to the Administrator of EPA the authority to issue regulations to carry out the purposes of the order. Pursuant to such delegation, EPA proposed regulations (38 F.R. 16241) on June 21, 1973, implementing the 1971 order. (Those regulations will, of course, have to be revised in light of the new Executive order.) Section 15.3(1) of those regulations defines the term "facility" to mean "a non-Federal building, plant, installation, structure,

mine, area, location, or site of operations to be utilized in the performance of a contract, grant, or loan." If EPA uses this same definition in connection with the new Presidential order, only the words "area, location, or site of operation" could conceivably apply to SCS projects. Given SCS's previous reluctance to involve EPA in its projects, it is doubtful that SCS will construe these words to apply to SCS projects.

Several aspects about this matter concern this Committee.

First, there is no justification for the failure by EPA and OMB to prepare, and by the President to promulgate, the required Executive order within the time prescribed by Congress. Neither EPA nor OMB has offered any explanation for this failure and disregard for the law. The similar 180 days deadline prescribed by Congress under section 306(c) of the 1970 Clean Air Act Amendments was complied with when Executive Order 11602 was issued on June 29, 1971, *supra*. Thus, it can hardly be argued that the identical deadline under section 508(c) was too short, particularly since the final product is nearly a carbon copy of Executive order 11602 with some minor revisions "to incorporate the water provision." Surely, it did not require over 10 months to perform this simple task.

Second, EPA's narrow and erroneous interpretation of section 508(c) undermines its public expressions of concern about the water quality effects of channelization and its inability to deal with the problem effectively under Executive Order 11507 of February 4, 1970, *supra*. Section 508(c) has provided an adequate statutory basis for greater Federal effort on the water quality aspects of stream channelization financed by the Federal Government. But EPA frustrates the congressional purpose by its interpretation and by its policy declaration that section 508(c) should not "be made applicable to stream channelization."

The Committee therefore recommends as follows:

Executive Order 11738 should be revised to include a specific requirement that SCS obtain from the appropriate State water pollution control agency, or from EPA, in appropriate cases, a certification that the proposed project will, as a minimum, maintain the chemical, physical, and biological integrity of the affected waters.

The foregoing recommendation is analogous to the provisions of section 401 of the Federal Water Pollution Control Act, which require that every applicant for a Federal license or permit to conduct any activity which may result in a discharge into navigable waters must first obtain a certification from the State

water quality agency that the discharge will comply with the effluent limitations and standards of performance prescribed under sections 301, 302, 306 and 307 of the Act.

Alternatively, EPA could broaden the definition of the word "facility" in its implementing regulations to encompass the SCS program as the Congress intended, and provide that SCS obtain the certification recommended above.

VIII. ALTHOUGH THE PUBLIC OUTCRY AGAINST CHANNELIZATION HAS IMPELLED SCS AND THE CORPS TO LISTEN TO AGENCIES AND GROUPS SEEKING PROTECTION FOR WILDLIFE VALUES, CHANNELIZATION AGENCIES FREQUENTLY DISREGARD THEIR RECOMMENDATIONS

The public outcry against channelization and the heretofore veiled maneuvers of local watershed developers has greatly escalated in the past three or four years. One positive value of this increased public concern has been the development of a greater willingness by the SCS and the Corps of Engineers to listen to State fish and game agencies and environmental groups. They have been invited to participate, as they seldom were before, in the earliest stages of watershed work. Several State wildlife leaders who testified at the Committee's hearings confirmed the change. Mr. Charles D. Kelley, chief of the Game and Fish Division in the Alabama Department of Conservation, summed up their consensus: [113]

> * * * We found in Alabama that a great deal of planning, a great deal of effort, starts with SCS; then they go to the local sponsors and present this to the sponsors; then the sponsors come back to SCS and say this is what we want. A lot of minds are made up and a lot of plans are completed before the public gets too much involved—I mean the game and fish people or the people outside the immediate area.
>
> But I would say in all fairness to the situation in Alabama that we are now getting in on it at the early stage. We are making field trips, we are working with them, the initial teams. I think this is very constructive. I think had we done this 15 years ago we probably wouldn't be sitting here today.

SCS Administrator Grant deserves a large share of the credit for recognizing the new public temper. His recent Watersheds

[113] Hearings, part 3, p. 1373.

Memoranda, especially numbers 101 and 108, and his Environment Memorandum 1, have set the stage for a new era of candor and cooperation with wildlife interests.

Environment Memorandum 1 is basically a series of guidelines for the enforcement of the National Environmental Policy Act. It includes this statement:

> As early as possible, and in all cases prior to decision to take action, SCS, in consultation with other federal, state and local agencies, is to assess in detail the potential environmental impact of the proposed action to insure that adverse effects are avoided and that environmental quality is restored or improved.

The Administrator's new declarations of policy will, hopefully, encourage cooperation between the SCS and the State agencies. However, neither the Federal nor the State fish and wildlife agencies have any real assurance that their recommendations will be adopted and carried out. This is indicated by the testimony of Mr. Kelley, Dr. O. Earle Frye, Jr., director of the Florida Division of Game and Fresh Water Fish; Mr. W. H. Turcotte, chief of the Game and Fisheries Division in the Mississippi Game and Fish Commission; and Mr. Wilbur Boldt, deputy commissioner of the North Dakota Game and Fish Department: [114]

> Mr. REUSS. What assurances do you have that your views will prevail?
>
> Mr. KELLEY. None.
>
> * * * * *
>
> Mr. FRYE. I think I would agree with Mr. Kelley. But I would make one point—we have commented on practically everything at one stage or another. Our real concern is that our comments didn't receive a heck of a lot of consideration.
>
> Mr. REUSS. Were they rejected?
>
> Mr. FRYE. Well, no, not rejected. They just didn't do it.
>
> * * * * *
>
> Mr. REUSS. Would you [Mr. Turcotte] agree with Mr. Frye that Memorandum 108 by no means assures that the judgments of your fish and game department will in fact be adopted by the Soil Conservation Service?
>
> Mr. TURCOTTE. I do. * * *
>
> * * * * *

[114] Hearings, part 3, pp. 1374–1375.

> Mr. BOLDT. I think what these three gentlemen have said pretty much goes along with what has happened in North Dakota. In the past—10 years ago or back beyond that—we had very little opportunity to comment on these watershed programs. However, more recently we have had a biological watershed task force: People from the State Game and Fish Department and Soil Conservation Service and Bureau of Sport Fisheries and Wildlife who have reviewed and looked at these projects.
>
> However, some of the recommendations that we have made and some of the alarm that we have shown on these watershed projects have not been considered too seriously by the watershed planning party.

The Subcommittee found little evidence that the new SCS rapprochement with the State fish and game agencies had led to substantial restraint or reduction in channelization. Scores of streams are still being bulldozed. Scores of P.L. 566 projects have been completed with no appreciably greater concern for fish, wildlife or wetlands than the local sponsors have previously shown. At the 1971 hearings, the witness for Friends of the Earth, Mr. Brent Blackwelder, asserted: [115]

> Lack of sincerity on the part of the SCS to comply with criticisms of channelization is evident at many points. The SCS has issued memorandums urging full cooperation and coordination with State game and fish commissions; yet the fact is that in many States channelization projects continue despite the strenuous protests of the game and fish commissions. The Georgia Game and Fish Commission had to do an entire magazine outlining the environmental disaster caused by channelization because of SCS neglect of its recommendations.

Mr. Billy Joe Cross, Executive Director of the Mississippi Game and Fish Commission, confirmed Mr. Blackwelder's judgment, when the Subcommittee asked whether his agency is allowed to participate in SCS project planning: [116]

> In reply to your question on the extent we participate in the planning, we would have to say "None" until the last couple of years. Some projects were not even sent to us for review. In many others the local landowners had been given such a "hard sell" by the SCS or corps

[115] Hearings, part 1, p. 114.
[116] Hearings, part 3, p. 1502.

> personnel that by the time we saw the project there was no way of convincing these people that it was not the best thing that could happen to them.
>
> Within the last year we have been consulted a little more on projects, but with the limited funds and personnel we have we cannot compete with the planning and development set forth by the Federal agencies. They have local representatives selling their story constantly while we have one or two men trying to cover the entire State.

What emerges from these comments is that the State game and fish agencies have been forced to remain in virtually an adversary stance in their dealings with the SCS, even in the new era of outward amity. The dialogue is increasing, but it is still quite uncertain whether it will result in greater protection for wildlife and environmental values.

In view of such uncertainty, many environmentalists have expressed to the Subcommittee their doubts that the Soil Conservation Service's belated bid for cooperation with the State wildlife agencies is anything but a propaganda gambit, designed to disarm critics while the same old channel-scouring goes on with increasingly disastrous effects.

Similar comments have been made with regard to the Corps of Engineers.

From Mr. Dean A. Murphy, Superintendent of Game Management for the Missouri Department of Conservation: [117]

> About three weeks ago we received our first inkling that a St. Francis River Basin project had reached the construction stage—following 1954 congressional action—when a Memphis District Corps of Engineers real estate agent phoned regarding their acquisition for channelization purposes of 10 acres from our 269-acre Bradyville wildlife area, a relatively small but important southeast Missouri waterfowl area. Our second clue was when a southeast Missouri newspaper called to inquire of project effects. To date, we've seen no environmental statements, no studies of alternative ways to accomplish the results or anything else.

From the California Department of Fish and Game: [118]

> * * * Our Department has tried, with little success

[117] Hearings, part 3, p. 1295.
[118] Hearings, part 3, pp. 1407–1408.

> to date, to preserve fish and wildlife resources during construction of most Federal channelization projects. From our past experience, we have concluded that the preservation of our Nation's fish and wildlife resources cannot be assured under the existing Federal system, and that therefore laws and policies must be changed
>
> The Corps has * * * made a token effort to mitigate the loss of wildlife habitat caused by levee repair and stream channelization projects. These efforts have been generally unsuccessful since the local maintenance districts will not recognize fish, wildlife or esthetic values in their maintenance program. A "bare earth" policy results as the cheapest maintenance method.
>
> * * * In at least one case, Battle Creek in Shasta County, the recommendations of our Department and the Bureau of Sport Fisheries and Wildlife were solicited and then largely ignored by the Corps. Valuable salmon and steelhead spawning gravels were lost.

From Mr. John W. McKean, director of the Oregon Game Commission: [119]

> The Corps has generally disregarded our concern and continues to do this type of channelizing [with levees] on smaller streams. Often during the first high water these levees wash out and the gravel ends up in the farmer's fields. This kind of channelization has caused several streams to become even more unstable, eroding areas where the natural cover has been removed.

IX. IN RESPONSE TO ITS CRITICS, THE SOIL CONSERVATION SERVICE IN EARLY 1971 INITIATED ITS "MEMORANDUM-108" REVIEW OF SEVERAL HUNDRED WATERSHED PROJECTS INVOLVING CHANNELIZATION

> The bureaucracies call it flood control or soil conservation. And then they turn one more wild river into an ugly piece of machinery. It's time Americans recognized the real threat to our waterways.[120]

This statement is typical of the concerns expressed in thousands of articles and news stories throughout the Nation in the

[119] Hearings, part 3, pp. 1527–1528.

[120] James Nathan Miller and Robert Simmons, "Crisis on Our Rivers," reprinted from Readers' Digest, December 1970, hearings, part 1, p. 40.

late sixties and early 1970's. Subcommittee Chairman Reuss summed up their allegations at the May 1971 hearings as follows: [121]

> * * * We have received numerous complaints that many projects have resulted in a wide variety of adverse effects. Thus, it is said:
>
> (a) Game and waterfowl habitat and trout streams are destroyed.
>
> (b) Channelization of natural streams often pollutes downstream lakes and reservoirs. The racing water carries nutrients, chemicals, silt, and other pollutants downstream and deposits them in slower moving waters to the detriment of downstream communities.
>
> (c) Channelization often drains swamps and thus destroys their ability to act as "giant kidneys" which remove from the water that passes through them the silt, organic wastes, and toxic chemicals coming from agricultural, industrial, and other sources.
>
> (d) Stream channelization for flood control purposes encourages farmers to use their own funds to construct lateral ditches to drain their wetlands and potholes in order to bring presently unused land into cultivation. This results in largely nullifying the Reuss amendment, which has been a part of the Agriculture Department Appropriations Acts since 1962, and which prohibits use of funds appropriated under the agricultural conservation program to aid in draining these valuable wetlands known as types 3, 4, and 5.
>
> (e) Channelization increases erosion upstream, and flooding downstream.
>
> (f) Although a single project may involve only a part of one stream, the cumulative effect of hundreds of projects destroys vast areas of wildlife habitat in the south and nullifies the Federal investment in wetland areas in the north.
>
> (g) During wet seasons, channelization accelerates release of water which otherwise might percolate into the ground to recharge the underground water table for use in dry seasons. Thus, there is less ground water for streams during dry seasons. Holding water in a watershed contributes to ground water recharge and helps maintain water quality by keeping nutrients,

[121] Hearings, part 1, pp. 3, 4.

chemicals and silt out of community streams and lakes.

(h) Channelization in flood plain areas encourages further development of the flood plain and results both in greatly increased damages when large floods occur, against which channelization cannot protect, and increased demand for construction of more flood protection works downstream. Thus, channelization tends to be contrary to Executive Order 11296 of August 10, 1966, which directs all agencies to "provide leadership in encouraging a broad and unified effort to prevent uneconomic uses and development of the Nation's flood plains * * *."

These were not the mutterings of a few "kooks" or "eco-freaks"—as some proponents of unlimited earth modification describe those who question the wisdom of building environmentally detrimental or destructive projects. Rather, these were the anguished cries of concerned and respected citizens and citizen groups such as the American Forestry Association, National Wildlife Federation, National Rifle Association, National Audubon Society, Nature Conservancy, Izaak Walton League of America, Friends of the Earth, National Resources Defense Council, Sierra Club, university professors and students, heads of many State fish and game agencies, and hundreds of equally patriotic environmental groups throughout the country. They were calling for a moratorium on the continued use of this often devastating engineering tool of channelization that has been changing our Nation's streams and wetlands.

To their great credit, both the Corps of Engineers and the SCS heard the public's outcry and began to take responsive steps. For example, on November 30, 1970, the Corps issued new and promising environmental guidelines for its civil works program to mitigate specific ecological and environmental impacts in the planning and design of all its projects.[122] On February 4, 1971, the SCS issued Watersheds Memorandum No. 108, which required an SCS internal review of all pending and new watershed plans involving channelization.[123] Neither document went as far as these concerned citizens wanted, namely, to halt this practice at least temporarily. But they were a beginning that appeared promising.

As noted earlier, the bulk of this criticism has centered around the SCS's channelization procedures. Thus, it is illumin-

[122] Hearings, part 2, p. 560.
[123] Hearings, part 1, p. 386.

ating to see just what Memorandum 108 was intended to do and what it accomplished.

Memorandum 108 required each SCS State Conservationist to "review" existing plans for stream channelization and "to determine what changes in work plans or engineering design are needed to further national policy and goals for the environment." The objective of this review was to "classify" by the end of June 1971 the planned channel improvement of both natural and artificial channels in each State into one of the following groups:

Criteria	Group 1	Group 2	Group 3
(a) Effect on environment	Minor or no known adverse effect.	Some adverse effect	Serious adverse effect.
(b) Conformance to enumerated guidelines.	Clearly conforms or can be easily modified to conform. Modifications generally limited to minor changes in design and construction methods.	Some modifications are needed and can be made readily to conform to guidelines or to reduce or eliminate adverse effects. In addition to changes in design and construction methods, changes may include realinement, greater stability, and additional mitigation features.	Major modifications, possibly including reformulation, and major changes in purpose or scope needed to reduce adverse effects to an acceptable level. Changes may include reduction in amount of channel improvement, substitution of clearing and snagging for excavation, smaller capacity where appropriate, and substantially more mitigation measures.
(c) Economic justification	Benefit-cost ratio clearly favorable, using current estimated costs and applicable interest rate.	Benefit-cost ratio near unity but appears to be favorable, using current estimated costs for the project as modified and applicable interest rate.	Benefit-cost ratio less than unity for measures otherwise in group 1 or 2. Reevaluation necessary to reaffirm economic justification. For measures otherwise in group 3, the benefit-cost ratio should be computed in the same manner, using the same criteria that are applicable to new plans.

Memorandum 108 specified that (a) channel improvements placed in group 1 could be "implemented without further action," (b) the work plans of those placed in the second group must be supplemented or revised before they could proceed, and (c) those placed in the third group would require further study. The Memorandum directed that: [124]

> As soon as you [the SCS State conservationist] have completed the review, inform the State and Federal fish and game agencies, preferably by personal discussions, of the manner in which the review was carried out and the resulting groupings. Make it clear that they will be invited to assist in modifying projects in groups 2 and

[124] Hearings, part 2, pp. 1267, 1271.

> 3. In addition, obtain their comments on or concurrence in projects placed in group 1. If they express major disagreement, you may wish to reconsider your initial decision and place such projects in group 2 until further studies are made.

Skepticism was rife when SCS Administrator Grant announced the Memorandum. Mr. Charles H. Callison, Executive Vice President of the National Audubon Society, said at our May 1971 hearings: [125]

> * * * While calling for review of all watershed work plans that include channel improvement—"channel improvement" is the SCS euphemism for channelization—Memorandum No. 108, as we read it, proposes no real change in policy. It says channel improvement is not to be used where its primary purpose is to bring new land into production. But it says nothing to prevent or discourage channelization as a "secondary purpose" after flood prevention or other purposes.
>
> * * * * *
>
> The memorandum seems to give the green light to projects having a 1-to-1 benefit-to-cost ratio. Why? For whose benefit, we wonder? The dragline operator? If Congress is going to fund make-work projects for the benefit of the unemployed, cannot we find works of greater social usefulness and less environmental destructiveness?
>
> Or is the project with the cost-to-benefit ratio "near unity"—the phrase used in Memorandum No. 108—really designed to benefit the Federal agency, whether SCS, the corps, or the Bureau of Reclamation?
>
> Mr. Chairman, we cannot afford to destroy the natural ecosystems of our rivers and thus progressively to degrade the American environment just to support a Government bureau.

Another witness, Mr. Louis S. Clapper of the National Wildlife Federation, expressed "reservations" about the Memorandum, noting that "the guidelines outlined in this Memorandum seem to be predicated upon the assumption that channel improvement is to be planned and carried out." He asked: "What about the alternative of no channel improvement?" [126]

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[125] Hearings, part 1, pp. 11–12.
[126] Hearings, part 1, p. 63.

The concerns of these and other citizens proved well founded.

After the review phase of Memorandum 108 was completed, Administrator Grant, on August 20, 1971, provided to the Subcommittee a table showing the classifications of each project by State.[127] But dissatisfaction with the classifications and the procedures followed by the SCS State Conservationists in conducting this review has been rampant among conservation groups and others. Much criticism was centered on the lack of public participation in the review, although Memorandum 108 specified that SCS State conservationists should "consider" carefully "comments" of other agencies "and the public."

For example, in June 1971 a Birmingham, Alabama, citizen wrote to the SCS State Conservationist in Auburn, Alabama, and requested copies of the SCS 108 report on several projects in Alabama. The June 23, 1971, reply of the SCS Acting State Conservationist, Mr. W. B. Lingle, typifies SCS's attitude, at least at the field office level, toward public participation in the review of channelization projects. He said: [128]

> Public participation in the studies being conducted under watersheds memorandum 108 is being done through Federal and State game and fish agencies. In Alabama, representatives of the Alabama Department of Conservation and the Decatur office of the Bureau of Sport Fisheries and Wildlife have been fully involved in making the required studies. In other words, the Alabama Department of Conservation in this State is acting in behalf of Alabama citizens and organizations in making the review. The report required in watersheds memorandum 108 will be forwarded to our national office in the very near future. The memorandum does not specifically require, nor should it require, that copies of these reports be made available to the general public until reviewed and approved by the agencies mentioned above and by the Administrator of the Soil Conservation Service. These reports will be available at the Washington office of the Service.

The Alabama citizen, who had earlier complained that it was "excessive" for SCS "to require a Birmingham citizen to travel to Auburn to study public documents," was thus told to travel to Washington, D.C. to study these "public documents."

[127] Hearings, part 4, pp. 2704–2713. A revised table provided to the Committee by the SCS on Mar. 9, 1973, is available in Subcommittee files. The SCS said it was revised "to correct clerical errors found in the original table and to arrange the list alphabetically."

[128] Hearings, part 5, p. 3271.

Others, such as the Executive Director of the Florida Audubon Society, and representatives of the Natural Resources Defense Council, complained that SCS was marking its 108 reviews "for in-house use only."

Still another source of criticism was SCS's refusal to accept recommendations for deferral of projects for further study. In a July 26, 1973, letter to the Subcommittee, the BSF&W's Acting Regional Director in Atlanta, Ga., cited two small watersheds projects—the Lowland project in Pamlico County, N.C., and the Horse Range Swamp project in Orangeburg County, S.C.—where the Bureau recommended the projects be placed in Group 3. But, in each case, the SCS "did not accept" the Bureau's "recommendation."

On September 2, 1971, Mr. Roy K. Wood, the Bureau of Outdoor Recreation's Southeastern Regional Director, wrote to the Director of that Bureau, that the 108 memorandum "has been ineffective, at least within the scope of our awareness of its application, primarily because the Soil Conservation Service cannot accept the fact that anything the Soil Conservation Service does could be regarded as detrimental to the natural environment. Channelization is still considered stream improvement." [129]

In January 1971, Assistant Secretary of the Interior Reed testified that the BSF&W was participating in this review "to a limited extent at field level."

He later provided to the Subcommittee a November 3, 1971, BSF&W memorandum briefly summarizing the review up to that time. It said: [130]

> The River Basins staff of BSF&W has spent approximately 409 man-days assisting the Soil Conservation Service in this review. The Bureau did not participate in 13 of the 46 States in which project reviews were made. These States are: Connecticut, Delaware, Florida, Hawaii, Illinois, Michigan, Montana, New Hampshire, New Jersey, New York, Pennsylvania, West Virginia, and Puerto Rico (1 State, Region 1; 2 States, Region 3; 2 States, Region 4; 7 States, Region 5; and 1 State, MRBS). The lack of participation can be attributed to the following: no request from SCS, State game and fish agencies provided the review, and shortage of personnel.
>
> Of the 436 projects on which Phase I classification has been completed by the SCS, the Bureau disagreed

[129] Hearings, part 5, p. 3274.
[130] Hearings, part 2, pp. 485, 486.

> with their rating on 71 and did not participate in 185. In the States where the Bureau actively participated in the review, the State Conservationists forwarded to Washington 95 projects which were not discussed with BSF&W. Sixty-one projects were forwarded from States in which we did not participate in the review. There were 41 projects which were given a rating in the field but have not been forwarded to Washington SCS Office.
>
> It is apparent from the information obtained that the review under Watersheds Memorandum—108 was not uniform among all States. The consideration of BSF&W and State game and fish agencies comments depended on the attitude of the State Conservationist. In ten States all agencies were able to reach agreement on the classification, in 13 States projects were not reviewed by our agency, and in the remaining 23 States there was disagreement by the SCS in Bureau classification ranging from a few projects in some States to total disregard in others.

On April 29, 1972, several months after the Subcommittee requested that the BSF&W review the SCS 108 findings, Assistant Secretary Reed provided a second and more complete report summarizing the BSF&W's participation in the SCS review. The report notes that the SCS classified 238 of its projects wholly or partially in Group 1, while the BSF&W concluded that only 148 projects deserved this classification. The report states that the BSF&W "objected" to 82 projects totaling over 3,300 miles of channelization. However, because the Bureau lacked time and personnel to conduct a thorough review of these projects, it recommended a Group 2 or 3 classification where it had limited knowledge about a project. The Bureau's report concluded that: [131]

> The intensity and objectivity of the review by SCS under WS Memo–108 varied markedly from State to State. Generally, the variations reflect the viewpoints of the State Conservationist, his appreciation of environmental values, and the prevailing views and attitudes within his State. The intensity of participation in the review by BSF&W and the State fish and game agencies also varied for the same or other reasons.
>
> * * * * *
>
> The BSFW also found that many of its oral recommendations to SCS field personnel for classification were

[131] Hearings, part 5, pp. 3246, 3249.

not accepted and were not documented by BSFW for the record.

* * * * *

In conclusion we draw the following summary finding:

Concerning the conduct of the Watersheds Memorandum—108 review:

1. There were inconsistencies in the review as between States and as between agencies in the application of review criteria and

2. There are serious disagreements between BSFW and SCS as to the classification of individual projects, particularly as to projects to be placed in Group 1 on an environmental basis.

Another deficiency in the 108 review was that it was limited to a review of the effects of channelization on fish and wildlife. It did not, for example, include a review of other environmental effects, such as water quality. Neither the Environmental Protection Agency nor the State water quality agencies was consulted.

Despite these criticisms, the 108 review resulted in some modifications of projects and, as noted by Mr. Thomas J. Barlow of the Natural Resources Defense Council, gave the SCS offices an appreciation of the "magnitude" of the existing public concerns about the environmental hazards of these projects.[132] It was not a wasted exercise.

But it is not clear what the SCS is doing today with the 108 classifications. The 108 memorandum of February 1971 contemplated the establishment within the SCS of a "watersheds environmental quality committee" to—[133]

(1) Provide consultation and additional guidance for carrying out the view of all watershed work plans.

(2) Review the State reports and recommend appropriate action to the Administrator.

(3) Review the need for and place of channel improvement in the watershed program.

(4) Review and recommend appropriate changes in policy and in planning and design criteria to insure the preservation and enhancement of environmental values in watershed projects.

In response to the Subcommittee's July 1971 inquiry about SCS's delay in establishing the proposed watersheds environ-

[132] Hearings, part 5, pp. 2851–2852; 3353.
[133] Hearings, part 1, p. 358.

mental quality committee, Administrator Grant replied on August 20, 1971, that its establishment was "still under careful consideration." But he noted that conditions have "changed significantly" since the 108 Memorandum was issued: [134]

> The Congress has entered into this area of consideration through two hearings and language in connection with our appropriation act. The Council on Environmental Quality has now initiated a study of projects containing channel modification.
>
> I do not wish to create another level of review which requires still more time and overlaps activities and reviews already being carried out. Until the total picture of these requirements becomes more clearly in focus and I can determine the best possible make-up of the watersheds environmental committee, and the areas in which the committee can make the most significant contributions to the issues in question, I plan to delay formal establishment of this committee. In the meantime, we are making full use of the expertise and advice available within our agency, the State game and fish agencies, the Bureau of Sport Fisheries and Wildlife, and some outside consultants who are experts in their fields. We are giving careful consideration to all the issues raised, both at the field and Washington levels.

More than two years have elapsed, but the committee has not been established. However, the four objectives for which that committee was proposed deserve further attention. They have not been made obsolete or unnecessary either by the SCS 108 review, by the Subcommittee's intensive studies and hearings, by efforts in 1971 and 1972 to legislate a 1-year moratorium on SCS channelization, by the recently completed Arthur D. Little study of channelization for the CEQ, or by the countless efforts of fish and wildlife and environmental agencies and groups to bring new thinking to the massive and complex issues of channelization.

The Committee therefore recommends as follows:

The Soil Conservation Service should promptly establish a committee composed of representatives from other Federal agencies, the States, and the public to perform the functions proposed by the SCS Watersheds Memorandum 108 of February 1971 and publish its findings.

[134] Hearings, part 4, p. 2704.

X. COMPLIANCE BY THE SOIL CONSERVATION SERVICE WITH THE REQUIREMENTS OF THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 HAS BEEN SPOTTY

In 1970, Congress enacted the National Environmental Policy Act of 1969 (83 Stat. 852; 42 U.S.C. 432.1, *et seq.*) stating that its purposes are:

> To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.

Section 102 of NEPA mandates that "to the fullest extent possible": (1) "the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies" of that Act, and (2) that "all agencies of the Federal Government shall" develop procedures which will "insure that presently unquantified environmental amenities and values" be given "appropriate consideration in decisionmaking along with economic and technical considerations." (42 U.S.C. 4332.) It requires that each agency give "appropriate consideration" to environmental values in decisionmaking. Section 102 also requires "all agencies of the Federal Government" to prepare a "detailed statement" to be included in "every recommendation or report" concerning "Federal actions significantly affecting the quality of the human environment." That detailed statement must include each of the following matters:

> (i) The environmental impact of the proposed action;
>
> (ii) Any adverse environmental effects which cannot be avoided should the proposal be implemented;
>
> (iii) Alternatives to the proposed action;
>
> (iv) The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and
>
> (v) And irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

In addition, section 105 of NEPA declares that the policies and goals of NEPA "are supplementary to those set forth in existing authorizations of Federal agencies."

The Third Annual Report of the CEQ (August 1972) entitled "Environmental Quality" nicely sums up the importance of NEPA.[134a] The report states (pp. 224, 225):

> Although much of the public discussion of NEPA has revolved around the environmental impact statement procedure of section 102(2)(C), NEPA's substantive thrust cannot be overlooked. The primary purpose of Congress in enacting NEPA was to establish a Federal policy in favor of protecting and restoring the environment. The broad terms in which that policy is declared clearly makes all aspects of man's surroundings the subject of Federal concern.
>
> * * * * *
>
> Together, these provisions tell the agencies to add a new criterion—effect on the environment—to those against which they have traditionally tested their actions. The far-reaching result is that agencies whose statutory mandates previously did not call for attention to the environmental effects of their actions are now required to take those effects into account. *And agencies whose mandates previously directed their attention only to certain facets of the environment now have a responsibility as broad as the environmental policy declared in NEPA.* (Italic supplied.)

The CEQ report noted that NEPA policies have led to modification, and even abandonment, of some projects because their adverse environmental effects were "unacceptable". The report cited several such examples, including the Corps' indefinite postponement of its project to "channelize portions of the Buffalo Bayou in Houston, Texas, largely because of its negative esthetic effects". (P. 226.)

On March 5, 1970, shortly after enactment of NEPA, President Nixon issued Executive Order 11514 (3 CFR, Rev. as of Jan. 1973, p. 285) which affirmed that the Federal Government must provide "leadership" in protecting and enhancing environmental quality. He directed that all Federal agencies "initiate measures" needed to "direct their policies, plans and programs so as to meet national environmental goals." Full compliance

[134a] Title II of NEPA established the three-member Council on Environmental Quality to prepare an annual report and, among other things, to assist the President in implementing NEPA. To help the CEQ carry out its functions effectively, Congress on April 3, 1970, enacted the Environmental Quality Improvement Act of 1970 (84 Stat. 114) which established, in the Executive Office of the President, an Office of Environmental Quality to provide a "professional and administrative staff" for the CEQ.

with NEPA was the order of the day. The message to Federal agencies from the President was that they arrange their programs, policies, etc., to achieve such compliance quickly. They were told to identify, by September 1, 1970, program "deficiencies" or "inconsistencies" that might inhibit such compliance, and to develop "procedures," including public hearings to ensure the "fullest practicable" provision of "timely public information and understanding of Federal plans and programs with environmental impact."

The President directed the CEQ to provide leadership in the executive branch to insure compliance with NEPA, to issue guidelines to Federal agencies concerning preparation of environmental impact statements and, where necessary, to issue "other instructions" to the Federal agencies to carry out the Act.

Pursuant to this directive, the CEQ, on April 23, 1971, adopted its first guidelines for Federal agencies concerning the preparation of environmental impact statements (36 F.R. 7724).[135] Section 5(b) of the CEQ guidelines directed Federal agencies to prepare impact statements whenever "there is potential that the environment may be significantly affected," either by the individual project or cumulatively.

The U.S. Court of Appeals for the First Circuit, in *Silva* v. *Lynn,* No. 73–1200, July 5, 1973 (5 ERC 1654), described the importance of the impact statement as follows:

> The "detailed statement" required by [42 U.S.C.] § 4332(2)(C) serves at least three purposes. First, it permits the court to ascertain whether the agency has made a good faith effort to take into account the values NEPA seeks to safeguard. To that end it must "explicate fully its course of inquiry, its analysis and its reasoning." *Ely* v. *Velde,* 451 F.2d 1130, 1138 [3 ERC 1280] (4th Cir. 1971); *Appalachian Power Co., supra* at 507. *See also Natural Resources Defense Council* v. *E.P.A.,* ——F.2d—— (1st Cir. 1973); *Environmental Defense Fund* v. *Ruckelshaus,* 439 F.2d 584 [2 ERC 1114] (D.C. Cir. 1971). Second, it serves as an environmental full disclosure law, providing information which Congress thought the public should have concerning the particular environmental costs involved in a project. To that end, it "must be written in language that is understandable to nontechnical minds and yet contain enough scientific reasoning to alert specialists to parti-

[135] On August 1, 1973, CEQ published its revised guidelines (38 F.R. 20550; 40 CFR Part 1500). They are effective on January 1, 1974.

> cular problems within the field of their expertise." *Environmental Defense Fund* v. *Corps of Engineers,* 348 F. Supp. 916, 933 (W.D. Miss. 1972). It cannot be composed of statements "too vague, too general and too conclusory." *Environmental Defense Fund* v. *Froehlke,* 473 F.2d 346, 348 [4 ERC 1541] (8th Cir. 1972). Finally, and perhaps most substantively, the requirement of a detailed statement helps insure the integrity of the process of decision by precluding stubborn problems or serious criticism from being swept under the rug. A conclusory statement "unsupported by empirical or experimental data, scientific authorities, or explanatory information of any kind" not only fails to crystallize issues, *Natural Resources Defense Council* v. *Grant,* 355 F.Supp. 280, 287 [5 ERC 1001] (E.D. N.C. 1973), but "affords no basis for a comparison of the problems involved with the proposed project and the difficulties involved in the alternatives." *Monroe County Conservation Council* v. *Volpe,* 472 F.2d 693, 697 [4 ERC 1886] (2d Cir. 1972). Moreover, where comments from responsible experts or sister agencies disclose new or conflicting data or opinions that cause concern that the agency may not have fully evaluated the project and its alternatives, these comments may not simply be ignored. There must be good faith, reasoned analysis in response.

Initially, many Federal agencies resisted the requirement of NEPA that environmental impact statements be prepared in connection with their programs and projects. This resulted in a number of challenges in the courts in which the agencies generally were on the losing side. Today, such resistance has largely vanished and the court challenges center more on the quality and substance of the NEPA statements. But procedural problems and efforts to skirt the NEPA requirements still persist.

For example, the Corps established a priority for preparing impact statements that in many instances has delayed their issuance. When the Subcommittee asked the Corps on March 2, 1972, why it was proceeding with construction of the Carr Fork project in Kentucky without preparing an environmental impact statement thereon, the Corps replied on April 27, 1972, that: "Continuation of construction of the Carr Fork project pending preparation and filing of an environmental statement is considered in the public interest." The Corps said it had worked out with the CEQ a "priority arrangement" for the preparation

of impact statements which gives low priority to projects "in a construction status," such as Carr Fork. At the time of the Subcommittee's inquiry, the outlet works at the Carr Fork project dam had been completed, but work on the dam itself had not yet begun. In any event, the Corps informed the Subcommittee on December 8, 1972, that a draft impact statement "is under preparation and is scheduled to be filed with" the CEQ "before the end of 1972" and that a final statement would be filed "by the spring of 1973."

On August 1, 1973, the Corps informed the Subcommittee that even the draft statement had not yet been filed with the CEQ, although much of the work on the dam had been completed. The Corps said, however, that the draft would be filed with CEQ in October 1973.

The Corps, however, has at least established a system for preparing NEPA statements concerning Corps projects and, to its great credit, generally now tries to comply with NEPA.

The Soil Conservation Service's level of compliance with NEPA has been so low as to verge on deliberate evasion of the law.

In 1971, Subcommittee Chairman Reuss described SCS's failure to comply with NEPA requirements in its first impact statements on 28 projects as follows: [136]

> A review of 24 SCS environmental impact statements indicates that little attention has been given by the SCS to the environmental impact of these projects.[137] In at least one case, where 26 miles of channelization will take place, the SCS concludes in a brief three-page statement that "no adverse effects on man's environment are anticipated." The views and comments of other agencies were not even solicited, as required by the National Environmental Policy Act.

The CEQ was equally appalled by the inadequacies of the SCS impact statements. CEQ's General Counsel wrote to the Department of Agriculture as follows: [138]

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[136] Hearings, part 2, p. 391.

[137] The watershed projects are as follows: Tallaseehatchie Creek, Alabama; Spadra Creek, Arkansas; Upper Petit Jean, Arkansas; Upper Quachita River, Arkansas; Crooked Arroyo, Colorado; Headwaters of the Chattooga River, Georgia; North Oceanee River, Georgia; Clear Creek, Illinois; Lost River, Indiana; Lake Verret, Louisiana; West Carroll, Louisiana; Fish Stream, Maine; St. Mary's River, Maryland; West Branch Westfield River, Massachusetts; East Upper Maple River, Michigan; Bahala Creek, Mississippi; Indian Creek-Bobo Bayou, Mississippi; Newlon Creek, Montana; Clear Creek, Nebraska; Upper Turtle River, North Dakota; McKay-Rock Creek, Oregon; Pine Valley, Oregon; Rocky Creek, South Carolina; Wilson Creek, South Carolina; Hog Creek, Texas; McClellan Creek, Texas; Pond Creek, Texas; and Upper Cibolo Creek, Texas.

[138] Hearings, part 2, p. 392.

The Soil Conservation Service [environmental impact] statements have given us difficulties. While we have received 32 statements from SCS, *the SCS appears to be going through the motions in their preparation.* They are almost identical in form and appear to have been prepared in Washington from a standard form system rather than in the field. Most SCS statements fail to mention esthetics. Only one mentions how many miles would be channelized. Only two mention the number of acres of swamp or wetlands to be drained. None of them include Department of Interior Fish and Wildlife Service comments on environmental impact. *A change in the method of preparation of SCS 102 (2) (C) statements is clearly needed. The discussion of them in last week's hearings in the House Committee on Merchant Marine and Fisheries is indicative of the criticism outside of the Council on Environmental Quality upon SCS procedures.*

One way in which SCS 102(2)(C) statements could be improved would be to develop a form which would include significant environmental impacts of SCS projects. This form would cover some of the criticisms leveled at SCS regarding compliance with 102(2)(C). Here is a list of suggested items of such a form:

1. Total floodplain in project.
2. Total wetlands in project.
3. Amount of wetlands drained.
4. Artificial wetlands (added 'Duck windows' et cetera).
5. Acreage inundated dams ponds.
6. Number of dams.
7. Miles of streambank channelized (total of both sides).
8. Miles of channel inundated by structures.
9. Recreation potential—day use.
10. Wildlife—gains and losses.
11. Fishery—gains and losses.
12. Vegetation—nature of change.
13. Erosion and sediment—gains and losses.
14. Economic benefits.
15. Increased production of crops.
16. Esthetics.
17. Water quality.

18. Historical-cultural (will historic or archeological sites be inundated?
19. Land use changes.

> Comments of the Fish and Wildlife Service and other agencies consulted in preparation of the 102(2)(C) statement should be included. Alternatives should be carefully weighed. The statements would probably benefit by being prepared at field level offices. (Italic supplied.)

SCS's evasion of NEPA requirements is further illustrated by its handling of the statement on the Lake Verret watershed project in Louisiana. Like the others, it was three pages long. Although it mentioned that about 230 miles of "channel improvement * * * will be installed for flood prevention and drainage," it provided little information about the environmental impact of the proposed channelization.

In March 1971, the Conservation Council of Louisiana wrote to SCS State Conservationist J. B. Earle questioning the adequacy of the SCS environmental statement. He responded simply that the SCS was "in the process of reviewing all our watershed projects" with the fish and wildlife agencies "to determine if alterations are needed in the proposed" work plans. More than a year later, the Louisiana Wild Life and Fisheries Commission asked the SCS for an impact statement on this project. Administrator Grant responded in a July 9, 1972, letter that the SCS has "had no occasion * * * to reassess the basic course of action to which we committed ourselves in agreeing" to the work plan in July 1970 and "recommending" its approval to OMB. Two days earlier Mr. Grant informed the Natural Resources Defense Council that, "No modification of * * * the environmental statement is contemplated." Yet it was this very project which the Mayor of Morgan City, La., severely criticized in his letter of July 12, 1972 (see p. 32, *supra*), for its potential pollution and impairment of the city's water supply and consequent environmental blow to the city's survival.

Eight months later, on February 20, 1973, Mr. Grant reversed himself and sent a memorandum to Mr. Earle stating:

> The Watershed Work Plan for the Lake Verret Watershed, Ascension, Assumption, and Iberville Parishes, Louisiana, has been approved by resolutions adopted on February 7, 1973, by the Committee on Agriculture and Forestry of the Senate, and on September 26, 1972, by the Committee on Agriculture of the House of Representatives. * * *

> As you know, a final environmental statement was filed with CEQ on August 11, 1970, using preliminary guidelines available at that time. It is now apparent, however, that this statement is insufficient and that it must be revised and circulated for the necessary review and comments by other interested parties. * * *
>
> Subject to the foregoing, you are authorized to provide Federal assistance in the installation of works of improvement on the Lake Verret Watershed in accordance with terms, conditions, and stipulations contained in the work plan as funds appropriated for this purpose are made available.

In a March 15, 1973, letter to the Subcommittee, the SCS said that it "did not consider it appropriate to take further action on the project while it was under consideration by the Office of Management and Budget or by the Congress".

Thus, by simply waiting until the project had been approved by OMB and the Congress before proceeding to prepare an adequate environmental impact statement, the SCS deprived the OMB and Congress of the opportunity to have the benefit of the revised statement *before* approving the project.

Another example of how SCS has sought to evade NEPA requirements involved the Cameron Creole project, which included about 35 miles of channelization and the construction of a levee within the Sabine National Wildlife Refuge in Louisiana.

On August 6, 1971, Subcommittee Chairman Reuss and Ranking Minority Member Vander Jagt wrote to the Secretary of Agriculture about the Cameron Creole project, as follows: [139]

> During our examination of this project, we learned that a private citizen asked the SCS for a copy of the environmental impact statement required under section 102 of the National Environmental Policy Act (Public Law 91–190) and the Guidelines of the Council on Environmental Quality (36 F.R. 7724, April 23, 1971). Mr. J. B. Earle, SCS State Conservationist, told him on June 16, 1971, that:
>
> > *We have not prepared an environmental impact statement on this project.* The Louisiana Wild Life and Fisheries Commission and the U.S. Fish and Wildlife Service and local sportsmen's groups participated in the development

[139] Hearings, part 4, pp. 2608, 2609.

> of the work plan for this watershed project. They have recently requested some minor modifications in the levee to alleviate possible problems that recent experimental work indicated could occur. We have concurred in their recommendations and *we know of no adverse results from this project.* (Italic supplied.)

We fail to understand why the SCS has not complied with the procedural duties of section 102 of NEPA and prepared an environmental impact statement. It is unmistakably clear that the procedural duties of section 102 of NEPA must be fulfilled to the "fullest extent possible". The United States Court of Appeals for the District of Columbia Circuit emphasized this in its recent opinion (*Calvert Cliffs' Coordinating Committee, Inc. et al.* v. *U.S. Atomic Energy Commission,* Nos. 24,839 and 24,871, July 23, 1971) when it said (pp. 10–11):

> Thus the Section 102 duties are not inherently flexible. They must be complied with to the fullest extent, unless there is a clear conflict of *statutory* authority. Considerations of administrative difficulty, delay or economic cost will not suffice to strip the section of its fundamental importance. (Emphasis in original.)
>
> We conclude, then, that Section 102 of NEPA mandates a particular sort of careful and informed decisionmaking process and creates judicially enforceable duties.

In his August 23, 1971, reply, Assistant Secretary of Agriculture T.K. Cowden said: [140]

> In the initial review conducted pursuant to Watersheds Memorandum—108 the Cameron-Creole Watershed Project was placed in Group 2 because of environmental impacts. Subsequent to this action contacts were made by personnel of the Soil Conservation Service of this Department with representatives of the Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife, and the Louisiana Wildlife and Fisheries Commission. Agreement was reached with these agencies to some modifications of the structural measures which would reduce or remove the adverse en-

[140] Hearings, part 4, p. 2613.

vironmental impacts. It was agreed that the remaining impacts would not be significant.

* * * * *

This agreement to the modifications changed the grouping under Memorandum–108 from 2 to 1. Since the modified plan would have no significant adverse environmental impacts, no environmental impact statement was required under [CEQ] Guideline 11. Also Watersheds Memorandum–108 provides that once agreement is reached with the concerned fish and wildlife agencies that a project is in Group 1, works of improvement "can be implemented without further action except for minor changes of design and specifications and of construction drawings already prepared." Hence invitations for bids were solicited in July.

Subsequent to this action, you, the National Audubon Society and the Sierra Club have raised questions as to the environmental impact and the adequacy of the considerations given to the environmental values. The questions which you and they have raised would now appear to bring a degree of controversy into the proposed action. Therefore, under the provisions of Guideline 5(b) we are developing an environmental impact statement in accordance with Section 102(2)(C).

The Congressmen also wrote to the Interior Department about Mr. Earle's comment that the BSF&W "participated" in development of the workplan. They said: [141]

We are, however, at a loss to understand, if Mr. Earle's letter correctly reported the position of the Fish and Wildlife Service, why the Fish and Wildlife Service apparently has sanctioned this project with "some minor modifications in the levee to alleviate possible problems." Such acquiescence appears to be quite inconsistent with the Bureau of Sport Fisheries and Wildlife regional office's 1967 report, which said the project "will have a significant effect" on the Sabine refuge and marshlands around the refuge; the June 1970 report by the same regional office on constructed SCS projects in North Carolina which said that ". . . the practice of stream channel excavation is contrary to the stated policy of the National Environmental Policy Act;" and your own recent testimony before this Sub-

[141] Hearings, part 4, pp. 2616, 2617.

> committee "that stream channelization has had a devastating effect upon our nation's waterways."
>
> Certainly, the effect of channelization on a national wildlife refuge—the elevation of which does not "usually exceed" 2 to 3 feet above sea level—cannot be any less "devastating".
>
> We request that a thorough re-evaluation of this project and its effect on the Sabine refuge and surrounding marshland be promptly undertaken by the Bureau of Sport Fisheries and Wildlife and that a report thereon be submitted to this Subcommittee. Pending completion thereof, your Department should request that SCS halt work on this project.

The Interior Department's March 16, 1972, reply to the Subcommittee asserted that BSF&W had not agreed that the project would have "no adverse results", and that the "conclusion concerning the adverse results was reached" by the SCS "without our concurrence". [142]

The Committee notes, however, that as long ago as 1969, the BSF&W entered into an agreement with the SCS which does not mention any "adverse" project results, and recites that the "improvements authorized under the approved plan * * * are expected to enhance wildlife management opportunities on lands within the watershed and, in particular, on that portion within the" Sabine National Wildlife Refuge.[143] The BSF&W cannot have it both ways. It ought not attack the project as "adverse" to wildlife and simultaneously whisper meekly that it will "enhance wildlife management opportunities". Admittedly, 1969 was in an era when public concern about channelization was far less evident, and the BSF&W then stood almost alone in efforts to curtail engineering depredations. If the BSF&W asked for too much, it chanced the likelihood of a cold shoulder and a deaf ear from the SCS and the local project sponsors, and hence BSF&W often bargained for a partial loaf.

But in the case of Cameron Creole, the Bureau had the upper hand. Because the project involved construction within a BSF&W refuge, the local sponsors had to obtain a permit from the Bureau. Section 4(c) of the Act of October 15, 1966 (16 U.S.C. 668dd(c)) prohibits uses of a national wildlife refuge "unless * * * permitted" by the Secretary of the Interior under section 4(d) of the Act. Such permission can be granted only if the Secretary finds "such uses are compatible with the purposes for which"

[142] Hearings, part 5, p. 3134.
[143] Hearings, part 4, p. 2693.

the refuge was "established" (Sec. 4(d) (2)). According to Assistant Secretary of Agriculture Cowden, the local sponsors obtained a permit from the Bureau "to use the refuge in connection with the project." [144] It is obvious that the Bureau failed to utilize fully the tools available to it and now is seeking through NEPA to recoup its losses.

We commend BSF&W's renewed devotion to protecting wildlife, but the better avenue would be to withdraw its permit.

The SCS draft impact statement on the Cameron Creole project was filed in August 1971.[145] The Under Secretary of the Interior told the SCS, on January 10, 1972, that the project will affect the Sabine Refuge; that "the plan addressed in the draft environmental statement does not cover" two water control structures "later added to the project to regulate exchanges" of water; that these changes "evidence the uncertainty of the effects of the project" on the refuge and on the marine and estuarine resources; that the statement should "be withdrawn because of its inadequacy, its lack of full coverage of the plan as now visualized, and the remaining uncertainty as to the environmental effects"; and that further studies should be made.[146]

The SCS refused to withdraw it, filed its final statement, and insisted, in a letter to Interior dated March 7, 1972, that "the beneficial effects far outweigh adverse effects".[147] Interior's response of April 6, 1972, insisted that SCS's final impact statement does not "materially supplement information contained in the draft"; that it was prepared "without benefit of further studies", and that "we can find nothing in the final statement which would cause us to alter our views that the environmental problems involved are not fully understood and that a comprehensive study should be undertaken prior to initiation of the project." [148] But BSF&W did not rescind its permit.

Subsequently, SCS agreed to conduct the studies, but only upon assurance that the Corps of Engineers would issue a permit for the project and allow it to proceed.[149] The Interior Department told the Subcommittee that a committee was appointed in August 1972 to provide guidance for the study. But, after several meetings, Interior concluded "that the proposed project construction schedule would not allow sufficient time to conduct true baseline studies of existing preconstruction conditions, particu-

[144] Hearings, part 4, p. 2614.
[145] Hearings, part 4, p. 2697.
[146] Hearings, part 5, p. 3136.
[147] Hearings, part 5, p. 3137.
[148] Hearings, part 5, p. 3138.
[149] Hearings, part 5, p. 3141.

larly with respect to the contribution of nutrients to the estuarine and marine environment as a result of sheet drainage and tidal action." Accordingly, Interior "objected to the issuance" of a Corps' permit "until the studies have been completed." [150]

In sum, although SCS initially placed the project in Group 2 as part of its 108 review "because of environmental impacts", thereafter, SCS made some modifications requested by fish and wildlife agencies and labeled it a Group 1 project (minor or no known adverse effect), and then insisted that no environmental impact statement was needed. But for the persistent questioning of the project by the Subcommittee and several environmental groups, the SCS would probably never have prepared a NEPA statement.

Still another example of SCS's use of the 108 review process "to escape full compliance" with NEPA is the Chicod Creek project.[151] In that case, the NRDC filed suit in November 1971 to enjoin the SCS from financing and participating in the construction of the Chicod Creek channelization project. The court ruled on March 15, 1972 (*Natural Resources Defense Council* v. *Grant, supra*), that NEPA is "applicable" to the project "as it is an ongoing Federal project on which substantial actions remain to be taken", and that the SCS was misusing the 108 review process. The Court said:

> It is interesting to note that one of the Soil Conservation Service's own biologists, prior to the implementation of any mitigation, concluded that this project would have significant effects upon the environment. See letter dated March 24, 1971, from John P. Edwards, Biologist, to Mr. Charles L. Lehning, Jr. Also noteworthy is the fact that subsequent to Watersheds Memorandum 108, the Soil Conservation Service placed this project in Group 2, a category established by the Watersheds Memorandum indicating that projects placed in this group could have some adverse effect upon the environment. After certain mitigation measures were implemented, this project was placed in Group 1, signifying minor or no known adverse effect upon the environment. It is the opinion of this Court that an environmental impact statement should have been issued when this project was placed in Group 2.

Following that ruling, the SCS, on April 6, 1972, issued to its field offices its "Advisory WS–12" memorandum. This advisory

[150] Hearings, part 5, pp. 2821, 2822.
[151] Hearings, part 5, p. 3352.

established guidelines for preparing environmental impact statements on projects approved before January 1, 1970 "(1) with channel improvement scheduled for installation with fiscal year 1973 funds and (2) that were placed in groups 2 or 3 (WS–108 study) * * * *unless agreement has been reached that plans for structural measures, as revised, do not have significant adverse impacts.*" The need for impact statements on all other projects scheduled for installation with fiscal year 1973 funds "*will be determined on a case-by-case basis.*" (Italics supplied.) The memorandum also stressed that the "determination of the environmental impact is an SCS responsibility and is not to be relegated to another agency".[152] These instructions were generally repeated by Administrator Grant in Watersheds Memorandum-121 on September 1, 1972.[153] Neither memorandum was published in the Federal Register.

The effect of Memoranda 12 and 121 is that most projects involving channelization that were placed in Group 1 during the 108 review will probably not receive impact statements. Even projects in groups 2 or 3 could escape the need for an impact statement if, pursuant to some quiet arrangement—such as those noted by the Subcommittee during its investigation of the Cameron Creole and Chicod Creek projects—between the SCS and a fish and game agency to revise the work plans, SCS determines that the project does not "have significant adverse impacts". Thus, the 108 review—which was limited to fish and wildlife considerations, which did not consider other project impacts such as water quality, and which did not afford an opportunity for public participation—has become the primary basis for determining whether or not the SCS will prepare a NEPA statement. If the SCS intended to use the 108 review in this way, Administrator Grant did not disclose this fact in the Memorandum itself or to the Subcommittee.

When the Subcommittee questioned the SCS about the basis, in the law and the CEQ guidelines, for the SCS position, SCS responded: [154]

> We have not construed Public Law 91–190 (NEPA) to be retroactive to actions taken before January 1, 1970. We believe the Council on Environmental Quality has recognized this in guideline 11 which states, with respect to on-going projects, "Where it is not practicable to reassess the basic course of action, it is still impor-

[152] Hearings, part 5, p. 3218.
[153] Hearings, part 5, p. 3220.
[154] Hearings, part 5, p. 2854.

> tant that further incremental major actions be shaped so as to minimize adverse environmental consequences." Our Watersheds Memorandum—108 review identified projects from which adverse effects might result. These projects are being studied in consultation with fish and game agencies and modifications made, where appropriate, to eliminate or minimize adverse effects. In this way, we have complied with the intent of NEPA and the CEQ guidelines. If there is any reason to believe, or if other agencies believe, adverse effects may remain after modification, then an environmental statement is prepared for public display to show the basis for the project action.

CEQ Chairman Train disagreed with the SCS view as to the retroactivity of NEPA, and stated that NEPA applies to projects authorized prior to January 1, 1970. He said: [155]

> Mr. FINNEGAN. Mr. Train, the SCS, in reply to our questions, told us that they construe the National Environmental Policy Act as not being retroactive to actions taken before NEPA was enacted in January 1970. Is that your understanding of the court decisions and of the act, itself?
>
> Mr. TRAIN. That is neither my understanding of the court decisions nor the Council's own policy. The act definitely applies to projects authorized prior to its effective date of January 1, 1970, as I recall, but where the major impacts with significant effect on the environment occur after that date.

SCS Memoranda 12 and 121 are not in accord with the court's opinion in the *Chicod Creek* case, insofar as they say that an impact statement is not required where projects in Group 2 or 3 have been revised and it is agreed that they no longer "have significant adverse impacts". The court, in the *Chicod* case, squarely held that an environmental impact statement "should" have been issued when that project "was placed" in Group 2 (some adverse effect), and *a fortiori* in Group 3 (serious adverse effect). At that time there was a clear indication that a project placed in those groups "could have some adverse effect upon the environment" and thereby require a NEPA statement. This same reasoning applies to all other SCS projects placed in either Group 2 or 3. But the SCS is apparently applying the court's ruling only to the *Chicod* case. Surely the SCS ought not

[155] Hearings, part 5, p. 2882.

litigate the issue over and over again on a project-by-project basis.

The Committee therefore recommends as follows:

The Soil Conservation Service should promptly abandon Watersheds Memoranda 12 and 121 and adopt a policy of full compliance with the requirements of section 102(2)(C) of the National Environmental Policy Act of 1969.

The SCS complied with the March 1972 court order in the *Chicod* case and filed a draft statement on April 17, and a final statement on July 13, 1972. The court then reviewed the impact statement and, on February 5, 1973, ruled (*Natural Resources Defense Council* v. *Grant,* Civil No. 754, 355 F. Supp. 280, 5 ERC 1001) that it "does not fully and adequately disclose the adverse environmental effects" of the project; "nor does the statement adequately disclose or discuss reasonable alternatives" to the project; and, therefore, there is substantial probability that NRDC "will be able to demonstrate at trial on the merits" that it is not "the 'full disclosure' statement required" by the court order of March 1972.

On March 30, 1973, the SCS recommended to the Justice Department that "appeal not be taken" from that ruling, because it "intends immediately to supplement the impact statement to meet the deficiencies" which the court "enumerated." On July 31, the Justice Department informed the Subcommittee that it would not appeal the *Chicod* decision.

Most Federal agencies are now generally preparing impact statements, but their quality is often quite poor. The CEQ commented on this at the Subcommittee's March 1973 hearings, as follows: [156]

> In terms of substantive assessment of impacts, there is much variation from project-to-project and agency-to-agency. Much of the variation is the direct result of the availability of environmental data. In some instances there are many data sources, in others very few. The corps has undertaken a number of research projects regarding environmental impacts of its programs, while BuRec [Bureau of Reclamation] has done so to a less extent, and SCS generally does not undertake such research.
>
> The agencies receive many comments on the draft impact statements, many of which point to significant environmental impacts. While the corps final EIS usually

[156] Hearings, part 5, p. 2806.

> acknowledges and discusses these impacts, many of SCS and BuRec final environmental impact statements fail to adequately consider comments related to adverse impacts and fail sometimes to balance these against project benefits.
>
> NEPA is an evolving process and we will continue to work with the implementing agencies to arrive at better and more comprehensive environmental impact statements. We are insisting that the impact statements fully reflect the nature and severity of the adverse environmental impacts and fully discuss and evaluate the alternatives to the proposed action.

The adequacy of environmental impact statements by Federal agencies was recently reviewed by the General Accounting Office, on the basis of a detailed examination of selected statements of six different agencies, including one each of the SCS, the Corps, and the Bureau of Reclamation.[157] In general, the GAO found that, although the agencies "were definitely concerned about the environmental impacts" of their proposed projects, "the usefulness" of the statements "was impaired" by several "common problems," such as:

> Inadequate discussion of, and support for, the identified environmental impacts.
>
> Inadequate treatment of reviewing agencies' comments on environmental impacts.
>
> Inadequate consideration of alternatives and their environmental impacts.

The Corps and Reclamation Bureau projects which GAO reviewed did not involve channelization, but the SCS project did. The GAO report noted that SCS's environmental impact statement for a project in Indiana and Ohio:

> Did not discuss the (1) impact on water quality resulting from the proposed project or (2) relocation of businesses and private dwellings resulting from acquisition of lands for the project.
>
> Was neither prepared in time to be available to the various agencies during their field reviews of the project work plan, contrary to agency guidelines, nor made available for public comment.

On December 18, 1972, CEQ Chairman Train wrote to Con-

[157] Comptroller General's report dated November 27, 1972, entitled "Adequacy of Selected Environmental Impact Statements Prepared Under the National Environmental Policy Act of 1969" (B-170186).

gressman Dingell that the "quality of impact statements is lagging behind procedural compliance" with NEPA, and that the NEPA statements reviewed by GAO, although they are "examples of early agency efforts * * * concededly fall short of full and fair analysis." The Department of Agriculture has assured the Congress that the SCS is making efforts to "improve the quality and usefulness" of its impact statements and is:

> Establishing the position of Assistant to the Administrator for Environmental Development and assigning environmental responsibilities to key staff members at all levels;
>
> Issuing 13 policy memorandums dealing with various aspects of environmental considerations;
>
> Revising project-type program handbooks to include procedures for making environmental assessments an integral part of the planning process and for developing environmental statements to aid in decisionmaking.
>
> Designing and conducting intensive training activities for all personnel on environmental procedures and commitments; and
>
> Maintaining close working relations and consulting with CEQ in development of policy, procedures, and in evaluating the adequacy of environmental statements.

The Committee hopes that the Department, including the SCS, will make even greater efforts in this direction, and that such efforts will help reduce channelization that is harmful to our Nation's streams and waterways and thereby help reduce the public opposition to those SCS projects which do aid the public good.

XI. IN MID-1971, THE COUNCIL ON ENVIRONMENTAL QUALITY CONTRACTED WITH ARTHUR D. LITTLE, INC., FOR AN ASSESSMENT OF THE PHYSICAL AND ENVIRONMENTAL EFFECTS OF STREAM CHANNELIZATION

Soon after the Subcommittee began its stream channelization hearings in May 1971, the CEQ concluded that an in-depth study of the physical and environmental effects of stream channelization, for the CEQ's "internal staff purposes in its policy-formulation work, is required within 5 months." [158] However, from the very beginning, that study has been steeped in controversy.

[158] Hearings, part 6, p. 3510.

A. CONTRACT BACKGROUND

On June 4, 1971, two days before the study contract was approved, Mr. W. Don Maughan, then Director of the Water Resources Council (hereinafter referred to as the "WRC") sent a memorandum to the CEQ in which he said that the "objective" and "scope" of the proposed study was "obscure." He added that it is "unrealistic to expect to find (a) an objective contractor whose work would be readily accepted by both the preservation and development interests, and (b) a competent contractor who could in 4 or 5 months seek, find, assimilate, evaluate, and succinctly report on a meaningful representative sample of channel improvement projects by government agencies." He then said: [159]

> In our opinion the essence of the channelization controversy is that inadequate attention has been given to the divergent private and social values associated with the use of preservation of channels, streams, valleys, marshes, and wetlands. Economic returns loom large in the eyes of landowners and users of flood plains for a livelihood. On the other hand, environmental benefits are not evaluated in the marketplace. Some means is needed to better reconcile these two basic objectives both in the short and long range. The States must be deeply involved.

Mr. Maughan testified before the Subcommittee on June 4, 1971—after the administration initially sought to prevent his testifying.[160] Under questioning by Congressman John E. Moss, Mr. Maughan revealed that in his proposed testimony he would have said that an adequate study of channelization, with "its complexity, broad involvement and the availability of much data that have to be digested and appraised," would require about two years. However, his proposed testimony was rejected in an interagency review. Mr. Maughan also expressed the view that during such study, all channelization should be deferred except for such projects as the Governor and a "high Federal official" agreed would be "badly needed for the protection of life or high value of property." [161]

As shown later in this report, the CEQ should have heeded Mr. Maughan's recommendations on the length of time needed

[159] Hearings, part 6, p. 3507.

[160] Soon after the Committee was notified that Mr. Maughan would testify, the Federal agencies "who have line responsibilities for channelization programs" decided that he should not testify. But at the Subcommittee's insistence, on May 28, 1971, the Interior Secretary, who is also Chairman of the Water Resources Council, agreed to allow him to testify. See Hearings, part 2, pp. 610, 611.

[161] Hearings, part 2, p. 611. His proposed draft testimony is printed at pp. 612–615.

for study and the importance of having a report which "would be readily accepted by both preservation and development interests." But the CEQ did not do so.

Even before Arthur D. Little, Inc. (hereinafter referred to as "ADL"), submitted its technical proposal, the CEQ executed a contract with ADL on June 6, 1971. It called for a study "to evaluate the environmental and physical effects of stream channel modification" that would be based "on an analysis of at least 20 representative projects."

Shortly after contracting with ADL for the study, CEQ directed ADL to subcontract to the Philadelphia Academy of Natural Sciences the work on fish and wildlife evaluations.

The contract initially recited that it would be completed by October 1, 1971. (The eventual completion date was March 1973.) The contract price was initially set at $65,000. (Eventually the price became three times that much.) [162] CEQ obtained a substantial portion of the contract funds from the Interior Department. The director of the ADL study, Mr. John M. Wilkinson, had for many years been involved with hydroelectric power economics.[163]

The ink was hardly dry on the contract when it was modified on August 24, 1971 (a) to broaden the study to include an evaluation of the "economic effects"; (b) to extend the contract completion date by one month; and (c) to increase from 20 to 36 the number of projects to be analyzed.[164] These changes were made despite ADL's expressed "concern" to CEQ about "the magnitude of the tasks * * * relative to the time and budget constraints" which CEQ "imposed", and ADL's proposal for evaluation of only 15 projects.[165] CEQ selected the projects from a list of 142 drawn from 9 Federal agencies, and ranked them according to priority. Mr. Wilkinson testified that "ADL did not participate in selection of these 36 projects." [166]

None of the projects that had received widespread public attention—such as the Alcovy, Cameron Creole, Starkweather, Chicod, Obion Forked Deer, and Cache River projects—was included in the list selected by the CEQ on August 6, 1971, nor amongst those selected by the 9 Federal agencies, according to the CEQ.[167] Only one of five projects marked "controversial" by the "cooperating agencies" was selected, namely, the Town Bank

[162] Hearings, part 6, pp. 3515–3522.
[163] Hearings, part 6, p. 3432.
[164] Hearings, part 6, p. 3523.
[165] Hearings, part 6, p. 3508.
[166] Hearings, part 6, p. 3429.
[167] Hearings, part 2, p. 479.

watershed project in New Jersey.[168] Moreover, only nine of the projects selected were recommended by the BSF&W or EPA, according to the CEQ list. For example, in Tennessee the environmental agencies recommended five projects, but none was accepted, although the two recommended by the TVA were included. When the Committee asked Mr. Wilkinson and the other members of the study team why none of the more "controversial" projects was included, they said: [169]

> Mr. WILKINSON. I cannot comment on why some of the more controversial ones, such as Starkweather or some of these others, were not involved. We were not included in that, and I simply do not know what went into the selection decisions.
>
> * * * * *
>
> Mr. FINNEGAN. Did you express any objections to the selections of the projects of the SEQ or suggest that they broaden them and include some of the controversial ones?
>
> Mr. WILKINSON. No, I never made any such suggestions.
>
> Mr. FINNEGAN. Did you, Dr. Patrick?
>
> Dr. PATRICK. No, sir. I mean, we were handed the list of projects as a fait accompli, and we did the ones that we were told to do. We did spend considerable time in the field and on some of the projects looked at other areas.

Mr. Thomas Barlow of the Natural Resources Defense Council also criticized the selection of projects in an August 16, 1971, letter to the CEQ, as follows: [170]

> We are deeply disturbed with the manner in which the Council on Environmental Quality's Stream Channel Modification Study by Arthur D. Little, Inc., is being conducted. There are a number of factors in Arthur D. Little's organization of this analysis and operating procedures for gathering relevant data which lead us and other conservation organizations to suspect that the results of this study will not be truly objective, but in fact, will constitute a whitewash of the environmental destruction caused by many channel modification projects.
>
> Mr. Boyd Gibbons has stated that "noncontroversial" channel modification projects have been selected for re-

[168] Hearings, part 2, pp. 476–479.
[169] Hearings, part 6, pp. 3442, 3443.
[170] Hearings, part 2, p. 481.

> view by Arthur D. Little research team. We submit that by avoiding "controversial" projects where groups are challenging stream modification because of the destruction this work will create, by studying those projects where there is no controversy, Arthur D. Little has biased the selection of evidence on which it will base its report and is already calling into serious question the objectivity of this future report.

In addition, Mr. Barlow's letter criticized the ADL procedures which appeared to exclude any public participation at the field hearings. He said:

> Although six Federal agencies were invited to become involved in this study—Water Resources Council, Office of Management and Budget, Environmental Protection Agency, Fish and Wildlife and Parks, Bureau of Outdoor Recreation, National Water Commission—*the field trips by the Arthur D. Little research team are being scheduled and arranged by the very agencies whose projects are being studied.* In Michigan, Arkansas, and Louisiana, which were visited by the Arthur D. Little group August 9–13, *officials of the Soil Conservation Service and Corps of Engineers were the group's official hosts, shepherding them throughout their itinerary.* The credibility of Arthur D. Little's objectivity will be questioned if they gather evidence for their report in such an intimate fashion with the agencies being studied. Can we expect the Arthur D. Little team to return to these States for an itinerary arranged by the Bureau of Sport Fisheries and Wildlife and a series of meetings at which the Bureau of Sport Fisheries and Wildlife officials will be the hosts?
>
> * * * * *
>
> It has been reported to us by representatives of private conservation groups that the Louisiana office of the Soil Conservation Service replied to inquiries about the Louisiana Arthur D. Little meetings that these meetings were not public meetings, that only Federal agencies were to be involved—other parties were not welcome. (Italic supplied.)

ADL's representative, Mr. John M. Wilkinson, disputing Mr. Barlow's contentions, stated he did not intend the field trips and inspection tours to be akin to public meetings, and stressed that "a little more time" for these field trips probably "would not have produced much incremental data," even though it

would "have enabled more views to be expressed by more people." [171] However, the opportunity for public participation and expression is often as important as, or even more important than, the fact-finding itself.

B. THE DRAFT REPORT

On August 6, 1971, Subcommittee Chairman Reuss and Ranking Minority Member Vander Jagt wrote to CEQ Chairman Train urging that the draft report be made available to the Subcommittee, State agencies, environmental and conservation organizations, and others as soon as it was sent to CEQ, and that they be allowed to comment on it before its completion.[172] Mr. Train agreed, and on March 24, 1972, CEQ Secretary Boyd H. Gibbons III, informed numerous agencies and public interest organizations that CEQ would welcome comments on the draft ADL report. Within the 30 days allowed for such comments, many State and Federal agencies and public groups and citizens responsed.[173]

Several of those commenting on the draft gave it high praise. For example, the Corps said it "appears to reflect a commendably objective approach to this sensitive subject." The Corps noted, however, that the projects "chosen for evaluation were developed under procedures and criteria that are not necessarily representative of today's project formulation," and that today's projects include greater "involvement of the general public and conservationist elements" than the projects studied.[173a]

A spokesman for TVA concluded that the study had "been reasonably successful." [173b]

The National Association of Conservation Districts said that the Association was "impressed with the comprehensiveness and objectivity" of the report and expressed the hope that it "can help to dampen the emotion with which channel modification has been discussed in recent years."

A similar comment was expressed by SCS's Administrator Grant.[173c] Indeed, the SCS cited the report in its April 13, 1972, letter to Senator J. W. Fulbright, who had asked the SCS to comment on a pamphlet he received on the subject of channelization. The SCS said that the ADL study was intended to "provide

[171] Hearings, part 6, p. 3430. However, the "Field Survey Schedule" and "Lodging Arrangements," prepared by CEQ, on December 22, 1971, give some credence to Mr. Barlow's criticism. In connection with each area visited, SCS or Corps personnel were the ADL local contacts and arranged to transport the ADL team. (Hearings, part 6, pp. 3458–3459.)

[172] Hearings, part 6, p. 3451.

[173] *For a list of those who filed comments with the CEQ, see Hearings, part 6, p. 3460.*

[173a] Hearings, part 6, p. 3554.

[173b] Hearings, part 6, p. 3551.

[173c] Hearings, part 6, p. 3552.

an impartial assessment of the channelization issue," and concluded that: [173d]

> The appraisals on these projects show little or no impact on fish and wildlife resource values but very measurable gains to the rural and agricultural economy.
>
> The Arthur D. Little report summarizes findings on the fishery resources of the projects: "On the 36 existing projects evaluated, we find total destruction to severe diminution the immediate and still prevailing result on six completed projects, temporary and minor disturbance to modest recovery on 15 completed projects and no appreciable adverse effects on 15 completed projects. For the six proposed projects, one would be seriously destructive to existing and potential resources, one moderately but temporarily disturbing, three would experience no effect as no resource exists, and one would beneficially affect an adjacent lake."

Most of the others who commented on the report did not believe it was as praiseworthy as the Corps, TVA, SCS, and the NACD indicated. For example, the Interior Department said: [174]

> We agree with the overall appraisal of the BSFW that the report manages to touch all of the beneficial and adverse impacts of channel modification but does so in such a way as to lead the public reader to conclude that (1) channel modification is not particularly degrading to environmental values in most instances and (2) environmental damages, when inflicted, are short-lived and reversible. This is an unfortunate and misdirected conclusion. The report evokes a wide range of reaction as attested by the fact that BR found the report "unusually objective" and BSFW found that it seriously "misses the mark" insofar as its assessment of project effects on the natural environment is concerned.
>
> *We conclude that it covers economic (financial) aspects fairly adequately, but is seriously deficient in its environmental assessment, the principal charge to the contractor.* We believe the report deficiencies stem from two principal sources. First, the contractor too often ignored and took positions contrary to the views of its environmental consultants, the Philadelphia Academy of

[173d] Hearings, part 6, p. 3486.

[174] Hearings, part 6, pp. 3554–3556.

> Natural Sciences (PANS), as the BSFW report documents. The disagreeing viewpoints expressed by the contractor were invariably in the direction of minimizing adverse environmental impacts and stressing economic benefits. Second, the selection of projects was such as to lend serious bias to the study—a shortcoming to which this Department was admittedly a party. Beyond this, the contractor did not give sufficient attention to larger questions of national policy on such matters as the actual and appropriate planning objectives, alternatives, interest groups that are and should be served by the practice, needs of future generations for reserve agricultural productive capacity and natural stream valleys, and the like. Natural needs for food and fiber vis-a-vis national needs for environmental excellence were not adequately discussed, along with alternative ways of achieving both objectives. (Italic supplied.)
>
> * * * * * * *
>
> We are concerned about the statements that much of the channel work would be undertaken by private interests in the absence of the Federal or federally assisted project. This being true, how good is the rationale for Federal involvement? What are the additional environmental costs that are averted by having a Federal project with local veto over environmental recommendations? Private development would probably place the financial costs where they belong—on the beneficiaries. The report indicates that this is frequently not the case under the present system. The entire question deserves more attention.
>
> * * * * * * *
>
> *The study was intended to get at the facts concerning environmental impacts of channel modification, but we believe it has failed to respond to that charge. We would not endorse its publication as drafted.* (Italic supplied.)

Several State fish and game agencies were also quite critical of the report. The Arkansas Game and Fish Commission said it "falls far short of the objectivity requirements set forth by CEQ."

The North Carolina Wildlife Resources Commission said:

> The strongest criticism of the entire report is epitomized in the implication carried by the sentence (page 13, paragraph 2, line 2) "Much more of the fisheries resource and habitat and the biological life of aquatic systems of natural streams has been destroyed than improved, and recovery of productivity is slow—*but streams do recover." This statement, made without qualification, leads the uninformed reader to the conclusion that no matter how damaging to fish and wildlife habitat the channelization may be, eventually the area will enjoy the dual benefits of project drainage plus restoration of the adjacent wetlands and the stream channel to their pre-project levels of productivity.* Nowhere in the report is the statement made that stream recovery inevitably is predicated upon failure of the sponsors to abide by their signed agreement to maintain the channelization. *In other words, stream recovery can occur only as the objectives of channelization are lost by neglect. Unless the sponsors renege upon their signed maintenance agreement, recovery is impossible.* The inverse relationship between stream recovery and the maintenance of channelization by the sponsors is too fundamental to be overlooked. (Italic supplied.)

EPA noted that the report "fails to present systematically the in-depth information and analysis required for a sound assessment of channelization," and "does not carefully analyze the controversial issues nor adequately discuss alternative approaches." [175]

The Georgia Game and Fish Commission said:

> We are disturbed by the preface which states that "the resolution need not, indeed should not, lie at the extremities of viewpoint". This statement is disturbing and tends to indicate that from the beginning a decision was made to reach some compromise in the middle ground and not consider the possibility that stream channel improvement might, in fact, be an undesirable practice which should not be continued. It appears that the study was conducted with this objective in mind. We do not feel that the basic philosophies of the stream channelization programs were investigated but that rather the physical accomplishments only were the issues in question. It is our feeling that the basic philoso-

[175] Hearings, part 6, p. 3576.

> phy of spending public monies for private benefiits, at the expense of public resources, must be questioned and was not during the course of this study.

Subcommittee Chairman Reuss and Ranking Minority Member Vander Jagt, after careful review of the draft ADL report, wrote to CEQ on May 31, 1972, as follows: [176]

> In our opinion, the report fails to provide a true assessment of the effects of stream channelization on the environment. It does not adequately discuss the merits of channelization nationally and regionally to achieve water control objectives, but simply assumes that a national program of channelization is necessary and should continue. The draft report also fails to discuss the change, that is now evident, from the original purpose of channelization to control floods in order to protect life and property to the quite different purpose of encouraging drainage of wetlands and reduction of floods in flood plain areas in order to convert such lands to the "better" or "higher" use of crop production. Its discussion of alternatives is largely an apology as to why alternatives to channelization are rarely, if ever, adopted.

On May 25, 1972, CEQ advised ADL that the report will "require very substantial reworking in a number of respects if it is to be the guide to policymaking." [177]

There then ensued several months of dispute and negotiations between ADL and CEQ about increases in the contract price and the scope of ADL's duties. Finally, late in December 1972, the contract price was further increased to $195,000, and on March 31, 1973, the report was completed.[178] One aspect of this dispute involved the extent to which ADL was obliged, but failed, to consider the comments which CEQ had solicited and received from non-Federal agencies. On April 11, 1973, the Subcommittee wrote to CEQ Secretary Boyd Gibbons as follows: [179]

> On May 25, 1972, you wrote to ADL commenting extensively on the ADL's draft report and referring to the foregoing written comments. You acknowledged in the letter that "many" of the comments "are well conceived, objective, and rational critiques" which should

[176] Hearings, part 6, p. 3481.

[177] Hearings, part 6, p. 3461.

[178] ADL's three volume report entitled "Report on Channel Modifications" is available at the Government Printing Office.

[179] Hearings, part 6, p. 3506.

"provide" ADL with "ample assistance" in redrafting the report. In that same letter, you advised ADL that it "is imperative that in rewriting the report" ADL should "review carefully your general and specific comments and those of the other commenting entities."

Subsequently, ADL wrote to you (letters of John M. Wilkinson, July 24, 1972, and Todd C. DeBinder, November 24, 1972) requesting additional funds because CEQ's "release of the draft report for public review increased the number of comments to be reflected" substantially. ADL said its January 1972 request for additional funds which was granted by CEQ on April 3, 1972, "did not allow for incorporation of comments from a public review," except those involving "corrections of fact."

In your reply of December 15, 1972, you agreed with ADL's interpretation of the contract and its modifications, and instructed ADL:

"* * * *only to take into account the comments of CEQ, other revewing agewcies, the Scientific Advisory Group, and your consultant*—a task for which you were specifically compensated in modification 3 [of April 3, 1972, to the ADL contract]. Aside from correcting errors of fact, which you indicate you intend to do, *you are to exercise your own judgment in evaluating the additional views of those groups outside the Government who provided comments on the draft.*" (Italic supplied.)

Thus, unbeknown to the public, you revised your May 25 instructions to ADL and, in an apparent effort to minimize the contract cost, issued new instructions that unnecessarily clouded ADL's adequacy of consideration of the public's comments in rewriting the report. It is ironic that CEQ had praised the public's written comments as "well conceived, objective, and rational," but then proceeded to instruct ADL that it was not obligated to take those comments "into account."

We think this was a serious error and false economy. Once CEQ, pursuant to our 1971 request, was committed to giving the public an opportunity to have an impact, through written comments, on the report, we believe it was incumbent upon CEQ to provide the necessary funds to meet this commitment. But you did not.

> It will now be difficult, if not impossible, for ADL or CEQ to convince the public that ADL exercised its "judgment" in favor of giving full consideration to the "additional views of those groups outside the Government who provided comments on the draft" report. Certainly, ADL was not paid to do so. After ADL received your December letter, ADL gave, we feel certain, only cursory consideration to those comments.

On May 8, 1973, Mr. Gibbons replied that the December 15 quote "was simply an accurate interpretation of the contract." He insisted that all comments were "assessed and analyzed" by ADL, and asserted that his own, as well as Interior's and EPA's, comments on the ADL draft report, "addressed the key points raised by the environmental groups." [180]

This dispute should never have occurred. It unnecessarily delayed the report. Moreover, it has left some doubt, despite Mr. Gibbons' assurances, about the extent to which the authors of the ADL report considered the comments of the non-Federal respondents. CEQ admitted that many of those comments were "well conceived, objective and rational critiques," and they contained many suggestions, and views not in, or varying from, the comments made by CEQ, EPA, and Interior. Since CEQ had agreed to the Subcommittee's 1971 request that CEQ obtain wide public review of the draft report, the CEQ should have incorporated that requirement in ADL's contract at that time to assure that the comments of the public were taken into consideration in the final version of the report.

C. THE FINAL ADL REPORT

At least some of the comments received by ADL must have been very helpful, since the final report is a vast improvement over the much criticized draft. Its findings should be quite helpful, although in many respects they are inconclusive and will not lay to rest the channelization controversy.

The report provides a great deal of information about the way projects are formulated, describes their effects on environmental values and resources, and assesses those effects. In addition, it discusses extensively the economic merits of projects, cost sharing and financial arrangements, and non-structural alternatives. It also states some general comments that help to illustrate the complexity of the channelization issue. For example, it states (p. 48):

[180] Hearings, part 6, p. 3507.

> * * * It is difficult to quantify, in economic terms, project induced damage to the environment and there is no established procedure or recognized extra-agency authority for evaluating a project on other than economic terms. Ultimately, of course, the decision to authorize a project rests with Congress, but the Congress is poorly equipped and would be inefficiently employed in the detailed balancing of non-commensurable effects on individual water resource projects.
>
> In practice, the judgment is made by the channeling agency in terms of the projects submitted for Congressional approval. These agencies are historically tied to efficient engineering solutions and economic evaluations, and to serving the needs of the local sponsors who are almost always economically motivated. These historical tendencies, originated and reinforced over the years by Congressional action, are coupled with general inadequacies in the environmental inputs to the design process. The result has been, and to a degree still is, that environmental aspects of channel projects are not adequately covered.

The ADL report emphasized the point that channelization is often selected in the development of a project simply on the basis of economics. It states (pp. 346, 347):

> While it is probably theoretically true that any flood problem can be solved by any of the major flood control alternatives discussed above, the actual selection is made on the basis of economics. *Floodways and reservoirs generally require more land than does channel modification.* These land requirements mitigate against these alternatives in two ways. First, the cost of acquiring or obtaining easements on the land is significant. Second, the basic purpose of the sponsors and the constructing agency is to protect land from floods and to free it for more productive use. *Land required for the project work is not in productive use and therefore the flood protection benefits associated with the project works are correspondingly reduced.* (Italic supplied.)
>
> * * * * *
>
> Channel modification, by contrast, affords protection at the point of the modification. Therefore, a flood control project based on channel modification can be

> finely tuned to give a maximum cost-benefit ratio. The designer can add one more mile to project length if the benefits accruing from that mile warrant the extension.
>
> * * * * *
>
> The use of levees, floodways or reservoirs in lieu of channel modification is technically feasible in most instances. While these alternatives are generally less disruptive to the environment, they will continue to be relatively little used as long as the historical economic evaluation criteria remain in force.[180a]

The report also criticized the lack of coordination or communication between "the local sponsors of projects and their constituent members on the one hand and the local or State fish and game interests and their broader and less well identified constituency on the other hand."

The report discusses the various aspects of most of the major channelization issues, but has one major shortcoming—it makes no recommendations. After reading nearly 400 pages summarizing the findings of ADL and the Philadelphia Academy of Natural Sciences, and several hundred more pages on field evaluation reports on 42 projects, the readers, and particularly the Federal agencies, are left to develop their own conclusions about what to do next. All readers of the ADL report can reasonably draw whatever policy conclusions fit their fancy, since the report rarely concludes that one side is more persuasive than the other. Even when the report seemingly takes a position, it is accompanied by several caveats. Thus, the proponents and the opponents of channelization can each just as easily claim that the report supports their respective views.

Mr. Wilkinson said: "We were asked not to recommend poli-

[180a] The TVA project at Sevierville illustrates these points. The TVA prepared two separate flood control plans; a comprehensive plan which was based on three reservoirs upstream of Sevierville, and the local channel modification plan eventually adopted. The economic estimates for the two plans are summarized below.

	Comprehensive plan	Local channel modification plan
Capital cost	$9,000,000	$2,700,000
Annualized costs per year	$311,000	$82,000
Annualized benefits per year	$505,000	$233,000
Benefit-cost ratio	1.6	2.8

Both plans are economically attractive, but the additional cost associated with the comprehensive plan produced diminishing returns and reduced the benefit-cost ratio from an impressive 2.8 to 1.6. This occurred, in large part, because the added protection provided by the reservoirs in the comprehensive plan accrued mostly to rural riparian lands between the reservoirs and Sevierville, lands on which the value of flood damages was minimal anyway. The citizens of Sevierville, faced with paying a fraction of the project costs, quite understandably selected the local channel modification plan.

cies but to provide the factual basis for" the CEQ "in its own policy deliberations." Indeed, he said that CEQ, strange as it may seem, did not want ADL to "specifically identify policy changes or policy recommendations." [181]

Subcommittee Chairman Reuss and Ranking Minority Member Vander Jagt, in a July 20, 1973, letter to the CEQ, commented:

> We think it is unfortunate that the ADL study team was given this instruction, since it was in the best position after its extensive work to make recommendations concerning any policy changes in the Government's stream channelization programs for consideration by your Council and by the public. Even if ADL's recommendations were not accepted by your Council, they would at least form a basis for your Council's developing its own recommendations * * *.

Several months have now passed, the $195,000 study is gathering dust, and the CEQ is still strangely silent. No new policies have been announced or publicly proposed, and the bulldozers, dredges, draglines, and other engineering tools are still busily channelizing miles and miles of streams and wetlands—hampered only by an occasional injunction resulting from litigation initiated by environmentally motivated citizens and civic groups. On September 16, 1973, CEQ told the Subcommittee that it has "advanced no definite proposals" nor "established a timetable for any such proposals."

When ADL submitted its "technical proposal" to the CEQ in June 1971, it said that the "issue" to be considered was whether stream channel modification, as one among many related water-management programs, provides sufficient values to offset costs when each is measured in both economic and environmental terms.[182] The report provides an excellent analysis of the many problems surrounding this "issue." It shows that some significant modifications in the policies, practices, and procedures followed by the channelization agencies and, in some instances, by the environmental agencies, must be made soon to reduce the schism between the proponents and opponents of channelization. But until the CEQ recommends such modifications to the President pursuant to section 204 of NEPA, it is doubtful that these agencies will act appreciably on their own to resolve these problems.

The Committee therefore recommends as follows:

[181] Hearings, part 6, p. 3440.
[182] Hearings, part 6, p. 3509.

The Council on Environmental Quality should promptly develop and, after providing public opportunity for comment thereon, recommend that the President promulgate, comprehensive guidelines for Federal agencies in planning and carrying out projects involving channelization. These guidelines should require the agencies to show affirmatively that the proposed channelization is in accord with the public interest and that adequate measures to prevent or mitigate environmental damage or destruction are effectivley provided for before work on the project is initiated.

The Committee notes that one matter not covered by the ADL report is the relationship of the Refuse Act of 1899 to the channelization program of the SCS. The court, in the *Chicod Creek* case, ruled that discharges of sediment and other refuse from the Chicod Creek project site "both during and after construction * * * without the requisite permit" from the Corps of Engineers violate the Refuse Act which prohibits such discharges.[183] The Government did not appeal this ruling.

Despite this ruling, the SCS has danced around the question of whether or not local sponsors must obtain permits from the Corps under the 1899 law. The SCS points to a "proviso" in the 1899 law which exempts from its application any "construction of public works." But in a letter of April 27, 1973, to the Subcommittee, the Department of Agriculture's General Counsel, Mr. John A. Knebel, concluded that "a determination as to whether a project is a public work within the meaning of the Refuse Act is one for the Corps of Engineers [to make] since it administers" the 1899 law.[184]

The Corps takes a different tack. It recently advised the Subcommittee that it "does not consider" the 1899 law "to be applicable" to SCS stream channelization projects, because it understands that such projects "are public works affirmatively authorized by Congress." [185]

On June 1, 1973, Subcommittee Chairman Reuss wrote to Mr. Knebel and to the Corps, questioning the Corps' conclusion that SCS projects are "public works," since the Department of Agriculture has for some 30 years followed the view that SCS projects "are not conducted by a department or agency of the United States" and therefore are not Federal projects.[186]

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[183] For a discussion of the scope and administration of the Refuse Act, see this Committee's report of August 14, 1972 (H. Rept. 92–1333), entitled "Enforcement of the Refuse Act of 1899."

[184] Hearings, part 5, p. 2940.

[185] Hearings, part 5, p. 2938.

[186] Hearings, part 5, p. 2941.

The Corps has not yet replied.

Mr. Knebel, however, in a June 26 letter to the Subcommittee, merely said:

> We have no basis for questioning the interpretation of the Corps of Engineers that the subject projects are "public works" for purposes of the 1899 Act.
>
> * * * * * * *
>
> With respect to the interpretation by the Corps that such projects are "affirmatively authorized by Congress," as that term is used in 33 U.S.C. 403, such interpretation would not appear unreasonable, particularly as to those projects which must be submitted to the appropriate committees of the Senate and the House of Representatives for approval pursuant to section 2 of the Watershed Protection and Flood Prevention Act (16 U.S.C. § 1002).
>
> In any event the Corps of Engineers has been given responsibility for the administration of the 1899 Act, and therefore necessarily has responsibility within the Executive Branch for the interpretation and implemention thereof.

On August 7, 1973, Mr. Barlow of the NRDC wrote to Administrator Grant, asking whether SCS is preparing "guidelines" to help "in securing" Corps permits under the 1899 law for 124 SCS projects in 25 States. Resolution of the issue may perhaps require further litigation, but it would appear, for the moment at least, that the Subcommittee's view, buttressed by the court's holding in the *Chicod* case, is more persuasive than the Corps' view.

XII. CONSTRUCTION AGENCIES FREQUENTLY CITE LOCAL OPPOSITION OR LACK OF CONGRESSIONAL AUTHORIZATION AS THE REASON FOR THEIR FAILURE TO PROVIDE ADEQUATE MEASURES TO MITIGATE FISH AND WILDLIFE LOSSES CAUSED BY A WATER RESOURCE PROJECT

Enactment of the Fish and Wildlife Coordination Act in 1946 resulted in the development of the concept of mitigation of fish and wildlife losses, *i.e.*, the installation of compensatory measures designed to lessen the impact of the loss of, or damage to, fish and wildlife resources caused by construction or other project work. In theory, that concept is quite sound. The water resource project can be built, despite its adverse effects on fish and wildlife

resources, because there will be compensation for any loss or destruction to the resources. But in practice, mitigation has been only mildly successful.

First, rarely are *all* such wildlife losses or damage mitigated.

Second, once a wetland area is drained, its valuable ecosystem is lost forever. It cannot be replaced. Acquisition of another wetland area in reality preserves only the latter area. It does not replace the area destroyed.

Several witnesses discussed this mitigation issue with Congressman Dante B. Fascell, as it relates to channelization, as follows: [187]

> Mr. ROGERS. * * * It is extremely difficult to provide methods that will adequately mitigate the loss of waterfowl or other wildlife habitat resulting from the destruction of wetlands and bottomlands upon the channelization of a stream. The nature of a channelization project requires drainage of adjacent areas. This means that often the lands acquired for mitigation will no longer be viable wetlands, and suitable habitat for waterfowl. Instead, they will have become upper bottomlands or uplands for all practical purposes.
>
> Further, it should not be forgotten that once wetlands are destroyed, they are not replacable; mitigation only means that other lands which may or may not have been eventually converted to other uses will now be set aside for so-called mitigation.
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> * * * * *
>
> Mr. FASCELL. * * * I just wonder then about the value of mitigation. I mean, can we or should we even be talking about mitigation as an element. If the statement is correct—and I have reason to kind of feel that way, that once the stream is changed, modified, or altered, and the wildlife is affected both within the project and outside of the project— is it possible in fact to actually mitigate the damage? Is there any case in which you could properly do it? Isn't the original destroyed? How could a swap of land for changed land mitigate the damage to the altered stream and land? I never have understood that. Can we consider, or should we consider, mitigation any more?
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> Mr. WANT. I agree with the inference of your statement that the focus should be on eliminating harmful chan-

[187] Hearings, part 6, pp. 3339, 3373–3374.

> nelization; but we have been trying that for years, and until that day comes, we would like to salvage what we can of the projects that are going ahead. Another aspect of mitigation is that, if it is required, and the costs are included in the cost-benefit ratio, it will indicate how expensive and economically unjustified these projects are, and hopefully lead to abandoning those projects that have become clearly unjustified in the terms of the real costs.
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> * * * * *
>
> Mr. BARLOW. Mitigation is particularly inadequate in Soil Conservation Service projects because the SCS has no continuing responsibility once the channelization work and the project are completed. Now, they might be promised by local sponsors that mitigation will be provided in the form of a lake, or a wetlands area that is going to be preserved, or a green tree impoundment which is going to be constructed by diking existing swampland. But once the SCS finishes the project and leaves, the sponsors do whatever they please. In many projects, mitigation has not only not been maintained properly, but sponsors have just moved in and destroyed this mitigation.

When the Subcommittee asked the Interior Department whether the mitigation measures recommended by the Department actually mitigate the losses resulting from a channelization project, the Department responded emphatically: "no. * * * In many instances, a new stream or wooded swamp would have to be constructed to gain complete compensation." This, the Department said, "is very unlikely." [188]

Recommendations for mitigation are voluntarily accepted by the water resource agencies in a limited set of circumstances. The Interior Department, in commenting on the extent to which construction agencies accept BSF&W recommendations for migigation measures, said: [189]

> In most cases, the Corps of Engineers and the Soil Conservation Service accept our recommendations for mitigation measures if they are minor in nature, do not adversely affect the project's benefit-cost ratio, and are acceptable to local sponsors. Generally, the Corps of Engineers is more responsive than the Soil Conservation Service because the costs of mitigation measures under Public Law 566 are assigned to project purposes caus-

[188] Hearings, part 5, p. 2817.
[189] Hearings, part 5, p. 2817.

> ing the damages, many of which are non-Federal responsibilities * * *. It sometimes appears that the Corps of Engineers and the Soil Conservation Service accept our recommendations knowing that local sponsors will reject them because of increased costs or unacceptable changes in land use. It should be noted that recommendations concerning the elimination of stream channelization often are met with resistance or outright refusal.

The efforts of the BSF&W to obtain mitigation measures for fish and wildlife losses in the Obion and Forked Deer Rivers project, mentioned above, are illustrative. As early as 1959, according to BSF&W wildlife biologist Crowther's May 21, 1970, memorandum mentioned above, the BSF&W recommended "alternative plans for stream development and measures to mitigate or prevent project-occasioned losses of fish and wildlife resources." Construction began in 1960 without inclusion of these measures. In fact, the BSF&W's memorandum noted that "had it not been for inability of the Tennessee Highway Department to acquire all the necessary rights-of-way, authorized project construction would be virtually completed today" (i.e. May 21, 1970).

In February 1973, the Senate authorized another $6 million, based on the Corps' recommendation, "to provide for the acquisition and development of 14,400 acres of land for fish and wildlife management purposes, development of the Gooch and Tigrett Wildlife Management Areas and minor channel modifications" at this project. The House has not yet acted on this legislation.[190] When the Senate acted, 32 percent of the project had already been completed. The Senate Public Works Committee's report noted that the "fish and wildlife problem" was caused by "Accelerated flood plain land clearing operations for agricultural production as a result of project improvements and increased demands for hunting and fishing opportunities within the watershed areas." [191]

Fortunately for the fish and wildlife, and the people who enjoy them, work on the project was halted in December 1972, when the U.S. District Court for the Western District of Tennessee issued its decision, in *Akers* v. *Resor, supra,* concerning the Corps' channelization of these rivers in Tennessee. The court noted that the environmental impact statement did not adequately

[190] S. 606, Flood Control Act of 1973. A similar bill (S. 4018, 92nd Cong.) was pocket vetoed by the President on October 27, 1972.

[191] S. Rept. 93–6, Jan. 29, 1973, pp. 27, 28.

discuss project alternatives, such as deferring channelization work until "after" mitigation land is acquired. The report also stated that the report "deals only peremptorily with the accepted importance" of wetlands in the project area "to the Mississippi flyway, to the production of waterfowl to the water quality in these streams and to other unquantifiable values."

Delays in acquisition of mitigation features and land speculation by private interests have resulted in land clearing and conversion to croplands, thereby negating wildlife values. In *EDF* v. *Froehlke, supra,* the court noted that the Corps "obtained authorization for acquiring some 6,000 acres of wildlife habitat" at one project in the St. Francis Basin, but between the time the Corps "selected the lands for authorization" and the time it "received" the authorization, "the lands were cleared and under cultivation."

The Corps has reported to the Subcommittee that since 1958 it has received authority to acquire land for mitigation purposes at four projects within the jurisdiction of the Corps' South Atlantic and Lower Mississippi Valley Division offices. The total authorized acreage to be acquired for these projects is over 45,500 acres. But only one-third of this total has been acquired—all at one project. At the Subcommittee's March 1973 hearings, the Corps' General Kelly discussed this delay in land acquisition as follows: [192]

> In some cases during the time lag between project authorization and project execution (funding for land acquisition), substantial changes occur within a project area due to local activity beyond the jurisdiction of the Corps. A specific example is the St. Francis Basin project where local interests have cleared and brought into agricultural production 13,500 acres of land which were originally intended to be purchased and managed for fish and wildlife purposes.
>
> We have not identified specific increases in Government costs as a result of delayed acquisition nor have we determined the acreage which no longer lends itself to mitigation acquisition because of changed land use. Any increase in costs would be due to two major factors. The first would be from general inflation or overall rise in land prices. The second would result where lands initially considered for acquisition become no longer suitable and substitute lands, more costly as a consequence of having become relatively scarce, must

[192] Hearings, part 5, pp. 2895–2896.

be purchased. When land has changed use and is no longer suitable for fish and wildlife purposes it is not acquired, so the increased value of these lands is not a factor in increasing Government costs.

One step we have taken to try and overcome cost increase problems is to avoid, in more recent survey reports, specifying the precise tracts to be acquired should the project be built. This greatly increases administrative flexibility in securing lands suitable for mitigation or enhancement purposes. The surest "cure" to the problem would be guaranteed expeditious funding of acquisition appropriations. Yet we must recognize the increasingly severe competition for available program funds and it is simply not feasible to establish any absolute priority for mitigation or enhancement acquisitions, regardless of potential merit.

The Interior Department was more critical of the "delay" factor and places the blame on the water resource development agencies. The Department said: [193]

Ideally mitigation should be accomplished prior to or in conjunction with installation of other project features. Land values normally rise with inception of project plan and land utilization patterns are typically changing. The time between preauthorization planning and initiation of construction of a Federal project is seldom less than 5 years and often more than 20. Land costs normally start escalating the day a Federal project is conceived. More often than not, the local landowners are violently against acquiring land needed to replace fish and wildlife habitat by the time construction is started. For all practical purposes, compensation for losses at this point is difficult if not beyond the realm of reason.

The Government's costs are increased when there is a delay in acquiring lands needed for "mitigation" of fish, wildlife, and other environmental losses. For example, the acquisition of the 13,500 acres of mitigation lands recommended for damages associated with the Corps of Engineers' St. Francis Basin feature of the Mississippi River and tributaries project in Arkansas and Missouri was authorized by the Congress in 1965. Unfortunately, acquisition was delayed until 1973 at

[193] Hearings, part 5, p. 2818.

which time most of the originally proposed mitigation lands had been timbered and converted to cropland. As a result, the cost of acquisition and the associated reforestation of croplands to bring about anticipated mitigation would have been substantially more costly and required many years to accomplish the desired results. Therefore, additional time, manpower, and funds are being expended by this Department for additional investigations and studies to determine acceptable alternative mitigation sites. The costs of these areas, in all probability, will be greater now than if they had been acquired in 1965 because of inflated values. In addition, the fish, wildlife, and environmental values of each remaining acre of timbered bottomlands substantially increases as additional wooded bottomlands are cleared and such habitats become scarce.

An example of inflated values resulting from land speculation is the proposed Reedy Creek wildlife management and enhancement area associated with the Central and Southern Florida flood control project. This area could not be purchased because of the substantial rise in land prices caused by the Walt Disney project.

In spite of the fact that fish and wildlife are referred to as "equal partners" in project planning, it is obvious the more traditional aspects of water development are "more equal." It is our feeling that the project construction agencies often fail to accept fish and wildlife measures as an integral part of a project but leave it dangling off as an isolated appendage which can be chopped off at any time it becomes obnoxious. Thus, those responsible for project costs and other features can excise this offending feature without damage to the remainder of the project.

In November 1958 BSF&W predicted the St. Francis Basin project would cause wildlife losses and recommended that the Corps acquire certain lands to partially offset the losses. The delay in acquiring these lands by the Corps and Interior was partly due to a requirement in the 1965 Flood Control Act that the Corps review the local cost sharing for the project and report thereon to Congress. The review was completed in 1967 and congressional approval given in 1968 (Public Law 90–483). By then, most of the "identified" mitigation lands were converted to croplands. BSF&W asked the Corps to acquire other

mitigation lands. But the Corps insisted, in September 1970 and June 1972, that the 1965 and 1968 laws would not permit it to acquire substitute lands and that *new* congressional authorization is needed. In January 1973, BSF&W "identified" substitute lands, and on July 12, 1973, the Corps held public hearings on the new acquisition proposal. Thus, a new cycle of proceedings commenced with no promise of success in mitigating project-caused wildlife losses.

In another situation, the BSF&W, in its letter of July 19, 1973, complained to the Corps that in March 1959 it had identified 12,800 acres in the Laito Lake to Jonesville segment of the Red River Backwater project in Louisiana as suitable for mitigation acquisition. As in the case of the St. Francis project, Congress had authorized the acquisition in 1965. But, once again, because of the Corps' delay in carrying out the mitigation effort, the lands authorized for mitigation acquisition had been converted to croplands. Furthermore, the Corps has narrowly construed its authority as precluding "the purchase of mitigation lands at an alternate site" in the project area without a new authorization from Congress.

A third example of delay in carrying out mitigation measures occurred at the Cache River project which was authorized in 1950. Planning began 13 years later—in 1963—and continued until June 1972, when a contract was made to clear and excavate 6.7 miles of the lower Cache. However, it wasn't until September 24, 1971, that the Corps presented a mitigation plan to acquire 30,000 acres for wildlife management purposes.

Several months later, on March 28, 1972, Acting Assistant Secretary of the Interior Curtis Bohlen commented on the Corps' plan and draft environmental impact statement. He said that the proposed channelization "will ultimately result in the clearing and drainage of over 170,000 acres," much of which is high value fish and wildlife land. He estimated that there are about 125,000 acres "of quality fish and wildlife lands which should be preserved" through the use of fee acquisitions and assessments. Mr. Bohlen stressed that Interior's "sanction of the mitigation plan is contingent" on the Corps cooperating with Interior "in the development of a program to preserve the remaining high quality wildlife habitat." He noted that the "Arkansas Game and Fish Commission has withdrawn its support for the project and has entered as a plaintiff in the legal action aimed at halting project construction." [194]

In his April 28, 1972, reply, Lieutenant General F. J. Clarke,

[194] Hearings, part 5, pp. 2895–2898.

Chief of Engineers, reminded the Interior Department that the BSF&W itself, in a report dated December 21, 1972, "recommended" to the Corps the acquisition of about 28,900 acres. He said that the Corps' September 1971 mitigation plan "is essentially the plan" proposed by the BSF&W in 1970. [195]

Unfortunately, General Clarke's comments do not reveal the entire story. The BSF&W commented on this project in 1953, 1959 and 1969, as well as in 1970. In June 1968, the Corps' District Engineer in Memphis, Tennessee, rejected the BSF&W recommendation for a diversion canal to divert floodflows from the Cache River to Bayou DeView. However, he stated, the Corps "would be pleased to consider other modification, or mitigation, measures, which are compatible" with the project's "purpose of drainage and flood control and would be acceptable to local interests." Thus, the BSF&W, in its "advisory" capacity, which places it at the mercy of the Corps and "local interests," pointed out in June 1969 that "land clearing has proceeded at a more rapid rate" than the Corps or the BSF&W "anticipated" in 1959 and implored that "effective means" of mitigating fish and wildlife losses be "explored."

On December 21, 1970—18 months later and 20 years after project authorization—the BSF&W, in a letter to the Corps' District Engineer in Memphis, Tennessee, recommended nine mitigation measures including the acquisition of lands. One of the nine measures was that:

> 5. No project funds be applied to construction work or structural features for flood control and drainage before fish and wildlife mitigation lands have been acquired or until eminent domain proceedings have been filed.

In commenting on its recommendation, the Bureau expressed considerable alarm about the delays usually inhibiting the achievement of mitigation measures. The Bureau said:

> We are concerned that the minimum time schedule required for obtaining modification of the project authority and the ultimate appropriation of necessary funds could entail a period of several years. In the interim, existing suitable forested lands that should be acquired to mitigate fish and wildlife losses may be cleared or altered, so that they will no longer be suitable or available for fish and wildlife conservation purposes. Therefore, if mitigation is to be effective, urgency is essential

[195] Hearings, part 5, p. 2899.

> in securing authorizing legislation and in placing a closing order on the desired tracts to halt further land clearing.
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> * * * * * * *
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> The results of past efforts to preserve these resources have been disappointing. Even in those cases where fish and wildlife mitigation was included in the project authorization, action had been delayed to the point where it became impossible or impractical to acquire the necessary lands. A major concern, in seeking authorization for mitigation, is to develop a procedure whereby implementation can be assured in a timely manner.

On December 7, 1970, the Arkansas Game and Fish Commission wrote to the BSF&W "that when and if fish, wildlife and environmental losses are mitigated at project expense and are funded by Congress concurrently with or before the construction aspects, then the Commission will drop its opposition" to the project.

In his March 28, 1972, letter to the Corps, Acting Assistant Secretary of the Interior Bohlen made a similar plea for urgent action on mitigation measures. He said: [196]

> The fish and wildlife resources in the Cache River Basin are of national significance and accomplishment of the mitigation plan should be assured and funded *prior* to initation of channelization work. (Italic in original.)

The Corps, however, was not swayed by this argument. General Clarke replied on April 28, 1972, as follows: [197]

> In regard to your recommendation that the mitigation plan be assured and funded prior to initiation of construction, our plans to initiate and complete the first item of work while the mitigation report is undergoing the review, authorization, and funding process were clearly presented at the public hearing held in connection with the mitigation report on 24 March 1971.
>
> Construction funds for this project were first made available by the Congress in fiscal year 1971; additional funds were provided in fiscal year 1972; and further funding is included in the President's budget for fiscal year 1973. Since the first item of work can be prosecuted without effect on the mitigation plan, there is ample

[196] Hearings, part 5, p. 2897.
[197] Hearings, part 5, p. 2900.

opportunity for the Congress to consider my recommendations. If and when the mitigation plan is authorized and funded by the Congress, we shall prosecute this plan in the same timely manner as we will prosecute the work already authorized.

In *EDF* v. *Froehlke, supra* (at pp. 351, 352), the court, in considering the adequacy of the Corps' environmental impact statement on the Cache River project, said in December 1972:

> * * * Responsible critics of the project have urged that no project be initiated *until a mitigation plan is actually put into effect* in order to prevent easily avoidable environmental losses. They state that following the commencement of construction, it will become difficult—if not impossible—to acquire suitable land for mitigation because of increased property values and the continued clearing of land for cultivation. Thus, in their view, any mitigation proposal is inextricably linked to the project itself. Such a view is not clearly without merit.
>
> Yet the Corps has provided no evaluation or analysis of the costs and benefits of delayed construction. This failure is contrary to the guidelines of the CEQ which states:
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> "* * * Sufficient analysis of such alternatives and their costs and impact on the environment should accompany the proposed action through the agency review
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> * * * * * * *
>
> process in order not to foreclose prematurely options which might have less detrimental effects."
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> * * * * * * *
>
> Here, neither agency decision-makers, such as the Chief of Engineers or the Secretary of the Army, nor the Congress were presented in the impact study with sufficient information to make an intelligent decision about proceeding with the project or awaiting the effectuation of a mitigation plan. Thus, the statement did not insure that the option of mitigation would not be prematurely foreclosed.
>
> *In addition, we see no practical reason why the Corps could not have included in its final impact study a thorough exploration of the possibility of mitigation in order to give decision-makers an opportunity to consider the possibility of delaying construction until a mitigation*

plan was put into effect. There is no suggestion that speed is of the essence in this project. It has already waited approximately twenty-five years. Furthermore, mitigation measures have been suggested by government agencies, at least since 1959. This is not a case where a previously unthought of or implausible alternative suddenly becomes practical because of the development of new sources of information or new technology. (Footnotes omitted.) (Italic supplied.)

The Corps submitted its proposed mitigation plan to Congress which, in the flood control bill of 1972 (S. 4018), modified and expanded it to provide for acquisition by fee or easement "of not less than 70,000 acres for mitigation lands." The bill was pocket vetoed by President Nixon on October 27, 1972, for reasons unrelated to this project. On February 1, 1973, the Senate passed a new bill (S. 606) which included the mitigation measure. The House will probably support this mitigation measure again. However, some of the States in the Mississippi flyway which filed *amicus* briefs in *EDF* v. *Froehlke* opposing the project have indicated concern that even with this mitigation the project will gravely affect migratory waterfowl.

The Committee believes that these long delays are contrary to the spirit and intent, and the plain language, of the Fish and Wildlife Coordination Act.

Mr. Edward Lee Rogers, General Counsel of the Environmental Defense Fund, noted in his testimony "that the Corps has traditionally taken the position that it cannot acquire lands for mitigation purposes without specific authorization" by the Congress "for that purpose," in projects authorized prior to the 1958 amendments to the Coordination Act. However, he stated that he believed the Corps was in error as a matter of law. He pointed out that the Solicitor of the Interior Department, in Opinion M–36643 dated December 18, 1962 (69 I.D. 224), ruled that section 3(c) of the Coordination Act provides ample authority "to acquire lands for fish and wildlife purposes in connection with previously authorized projects." The Solicitor's opinion noted that the Corps "would still be required to seek an appropriation to acquire such lands." The opinion noted that any construction agency might, however, decide in individual cases to "recommend the acquisition to Congress rather than" using this authority.[198]

Subsequently, on November 15, 1967, Secretary of the In-

[198] Hearings, part 6, pp. 3339–3340. The opinion was transmitted to the Corps on February 19, 1963, but the Corps declined to accept the Solicitor's view of the law.

terior Stewart L. Udall transmitted a copy of the Solicitor's 1962 Opinion to the Attorney General and requested that he rule "as soon as possible" on the matter. In his letter, Secretary Udall noted:

> It should be noted that the Bureau of Reclamation, pursuant to Solicitor Barry's opinion, has used this authority to acquire lands for several projects. For example, the Bureau has acquired or is planning to acquire over 90,000 acres at two projects—the Yellowtail project in Wyoming and the Columbia Basin. Also, in connection with the construction of the Cibola Channelization, in Arizona, as part of the Colorado River Front Work and Levee System, the Department recently requested the institution of condemnation proceedings, citing the Fish and Wildlife Coordination Act as authority, and Declarations of Taking have been filed. (See *United States of America* v. *436.06 acres of land, more or less, in the County of Yuma, State of Arizona, Robert H. Bishop, et al.;* and *United States of America* v. *151.99 acres of land, more or less, in the County of Yuma, State of Arizona, Dean H. Moore, et al.)*

Unfortunately, the Justice Department delayed acting on Interior's request, After almost two years had elapsed, the Interior Department's Solicitor, Mitchell Melich, wrote to the Attorney General on August 4, 1969, calling attention to the 1967 request for the Attorney General's opinion and noting that no reply "has ever been received." He must, however, have been quite chagrined when he received an August 14, 1969, reply from Assistant Attorney General William H. Rehnquist, as follows:

> This will confirm the conversation of August 8, 1969, in which Mr. Vaughan, Assistant Solicitor, Fish and Wildlife, told Mr. Sellery of this Office that your letter of August 4, 1969 (your file reference 19147.2594), should be deemed to be withdrawn. Your letter referred to the absence of a reply to former Secretary Udall's request of November 15, 1967, for an opinion on § 3(c) of the Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 663(c). Mr. Sellery told Mr. Vaughan that we have in our files an internal memorandum of January 7, 1969, stating that a few days earlier former Solicitor Weinberg informally advised former Deputy Assistant

> Attorney General Richman of this Office that the 1967 request should be deemed to have been withdrawn.

The Subcommittee has not yet learned why the Solicitor's office withdrew the request in early 1969. It certainly is not because the problem had been resolved, because it hasn't.

The lack of a definitive ruling on this issue is even more appalling, in the light of the following comment by Interior Secretary Udall in his 1967 letter to the Attorney General:

> There is pending before the Committee on Merchant Marine and Fisheries of the House of Representatives a bill, H.R. 7638, which is designed to resolve this issue. Since the matter is a legal one, we believe that it is best to resolve it within the executive branch. Accordingly, we have asked the Committee to refrain from taking any action on the bill this session of the 90th Congress pending your review and opinion.

In light of the language and legislative history of section 3(c) of the Coordination Act, it appears that the Interior Department's view of this section is legally sound. Particularly is this so in view of the National Environmental Policy Act of 1969 which declares that it is the Nation's policy "to use all practicable means and measures" to protect and enhance our environment. Mitigation is within that declaration, as noted by the court in *Sierra Club* v. *Froehlke, supra.* The court said: "NEPA states indirectly, but affirmatively, that under some circumstances Federal agencies must mitigate some and possibly all of the environmental impacts arising from a proposed project."

Moreover, in view of today's skyrocketing land acquisition costs, and considering the time it takes to process a proposal to authorize land acquisition through the Office of Management and Budget and the Congress, it is wiser policy for the Corps to seek ways to save Federal funds and wildlife by acting expeditously. The mitigation of fish and wildlife losses in the Cache River project still remains only a gleam in the bureaucratic eye because the planned measures are a small part of the larger flood control bill that has been caught up in other unrelated problems. Even after the bill is enacted, more time will pass before funds are appropriated to implement it. If the Corps had been willing to adopt the view of the Interior Department's Solicitor, particularly since NEPA, the mitigation measures for the project might have been closer to reality today.

The Committee notes, furthermore, that the Corps follows a complicated and time consuming "general procedure" before rec-

ommending to Congress that mitigation lands be acquired at "previously authorized" Corps projects. That procedure contributes to the delay and, most importantly, places on the BSF&W the entire burden of justifying the land acquisition. The procedure is as follows: [199]

> a. The Fish and Wildlife Service will be requested to prepare a plan of wildlife management for the project with particular reference to the lands needed, with support in detail, including benefits expected and method of accomplishment of the objectives.
>
> b. After receipt of the Fish and Wildlife Service report by the Chief of Engineers, a meeting of Fish and Wildlife Service and Corps representatives with interested Congressmen and Senators will be arranged.
>
> c. The views of the Governor and the head of the State agency exercising administration over the wildlife resources will be obtained.
>
> d. *A public hearing in the vicinity of the project will then be held jointly by the District Engineer, and the Fish and Wildlife Service, at which the latter will present and support its plan before the public.*
>
> e. *If it is decided to proceed with the wildlife plan after the hearing, a report will be prepared for this purpose by the District Engineer and include detailed information and recommendations upon which the authorization is to be based.* Supporting data, including the report of the Fish and Wildlife Service, will be included in the appendices. The Chief of Engineers will process the report to Congress. (Italic supplied.)

The Committee is concerned about the Corps' lack of promptness in providing for, and carrying out, measures to mitigate fish and wildlife losses on a timely basis. This lackadaisical drifting deals the taxpayer a double blow. First, it results in increased costs of land acquisition. Second, it causes additional and irreplaceable losses of wildlife habitat. In the latter case, funds from other Federal and State wildlife programs must often be diverted to compensate at least partially for these unnecessary losses.

As time passes, the matter will, of course, become less important because there will be fewer uncompleted projects whose authorization antedated the 1958 Act. Nevertheless, the Corps should

[199] Source: Corps' Regulation No. 1120-2-401 of August 14, 1970, appendix I. This regulation has never been published in the Federal Register or gone through the rulemaking procedures of the Administrative Procedure Act, *supra*.

endeavor to minimize the inevitable cost increases for such projects by more expeditiously developing mitigation measures to conserve and protect wildlife habitat. This is certainly the purpose and authority of the Coordination Act.

When land acquisition for mitigation purposes is required, it should be carried out before or concurrently with project construction. Once actual construction begins, fish and wildlife are displaced. Congress should not be asked to authorize such acquisition and then find that because of the Corps' delay in utilizing the authority, speculation and land clearing have imperiled the congressional efforts and intent. Moreover, the Corps, which is prompt in acquiring project lands in order to begin construction, should not be less diligent in acquiring mitigation lands. Clearly, the acquisition of mitigation lands deserves a greater priority in the Corps' project activities.

It is sad that the executive branch has not made more diligent efforts to resolve this issue. It is, furthermore, rather absurd that one Federal water-resource development agency (the Bureau of Reclamation) has interpreted section 3(c) of the Coordination Act as allowing it to acquire mitigation lands at its projects which were authorized before August 1958 without having to go to Congress for a separate specific authorization of such acquisition, while another Federal agency (the Corps) follows the opposite interpretation. Such a result is hardly in the public interest, especially since Congress has apparently not objected to the interpretation followed by the Bureau of Reclamation.

The Committee therefore recommends as follows:

The appropriate committee of the House of Representatives should consider clarifying section 3(c) of the Fish and Wildlife Coordination Act to insure that water resource development agencies can acquire in a timely fashion mitigation lands and interests therein without further authorization by Congress, but subject to obtaining an appropriation for such acquisition.

XIII. THE SCS'S STARKWEATHER PROJECT IN NORTH DAKOTA WILL DRAIN SIGNIFICANT WETLAND ACREAGE

A. THE COMPROMISES INHERENT IN REPORTING TO FISH AND WILDLIFE MITIGATION MEASURES HAVE NOT WORKED EFFECTIVELY

The BSF&W has, until recently, often been reluctant to air its professional displeasure with some channelization projects, and, in some cases, has been content to enter into compromises that have later proven environmentally unsound.

Earlier this year, the Subcommittee asked the SCS and the Interior Department about the extent to which the term "mitigation measures" has become a "euphemism for compromise" on the adverse environmental consequences of many channelization projects.[200] The Interior Department candidly admitted that any such measure is a compromise, saying: "The ideal objective should be to prevent damages, or at least compensate for all project losses." [201] The SCS, however, sought to redefine the term "mitigation." That agency said: [202]

> The term "mitigation" has come to have different meanings to different people. To the Soil Conservation Service in watershed projects it means a lessening, softening, or *amelioration of a loss of fish and wildlife habitat.* It may take various forms such as full or partial preservation, and full or partial replacement in kind or compensation. Precise results are difficult to achieve through "replacement" type measures because they are based on estimates and because the physical opportunities for replacement are often limited. We believe, however, that overcompensation is achieved about as often as undercompensation.
>
> The NEPA concept of minimizing adverse effects provides the means of clarifying some of the misunderstandings concerning mitigation measures. What were formerly considered "mitigation measures" now are planned features of the project taking all resource impacts into account. It is our policy to add more such features to the extent that they provide reasonably feasible solutions to reduce losses still remaining. All losses and gains expected from the project as planned are then described in our environmental statements. (Italic supplied.)

One highly controversial example of "compromise" or "amelioration of a loss of fish and wildlife habitat" is the SCS Starkweather project involving 246,000 acres near Devils Lake, North Dakota, in the heart of the prairie pothole country, which produces an estimated 65,000 waterfowl annually, not including coots and rails.

The project involves over 60 miles of channel construction, assorted land treatment measures, and a control structure on Dry Lake, and will "pull the plug" on both the Starkweather and

[200] Hearings, part 5, p. 2800.
[201] Hearings, part 5, p. 2817.
[202] Hearings, part 5, p. 2859.

the adjoining Edmore watersheds which include thousands of acres of potholes.

For years, the BSF&W has opposed this project, unless it "included the preservation of 75% of the type 3, 4, and 5 wetland acreage" in the Starkweather and Edmore watersheds.[203] In July 1969 the BSF&W, in its comments on SCS's proposed work plan, said the plan "is entirely unsatisfactory and is totally lacking in conception of the essentials of wetland preservation and compensation." The Bureau estimated that the project will cause waterfowl production to "decline by at least 60 percent." [204] Deputy Assistant Secretary of the Interior J. G. Watt, in an October 6, 1969 letter to the Secretary of Agriculture, recommended that the plan be "returned" to the SCS State Conservationist in North Dakota "for revision and reevaluation".

The difference between the two agencies' views is illustrated, also, by the wide discrepancy between the SCS and BSF&W estimates of wetlands affected.[205]

Unable to persuade SCS, the BSF&W finally agreed on January 19, 1970, to a compromise with the SCS and the project sponsors, and on June 22, 1970, agreed to the plan as revised to reflect the compromise agreement. However, the compromise did not involve a reduction in channelization or restrictions on the construction of drainage outlets. Instead, it was a vague and ambiguous agreement for the purchase of wetlands by the BSF&W in fee and easement.

Mr. Laurence R. Jahn, Vice President of the Wildlife Management Institute, testified that there was no opportunity "for full public participation or review" of the agreement before it was signed; that the North Dakota Game and Fish Department "refused" to sign it; that "wetland preservation goals" for the area "have been continuously adjusted downward"; that "through all the negotiations and compromises, the 13,500 acres" originally supposed to be preserved "finally became equivalent rather than actual acres"; and that the "anticipated" loss of wetlands will be about "55,000 acres." In addition, he stated: [206]

> The loss of 55,000 wetland acres can never be compensated for in this project, except in a very limited manner. The work plan does not provide for it and the

[203] For a description of wetlands types 1 through 5, see Hearings, part 3, p. 1987.

[204] Hearings, part 5, p. 3044.

[205] The SCS estimates are (Hearings, part 5, p. 2862): Wetlands affected—Type 3—246 acres, Type 4—988 acres, Type 5—7000 acres.

The BSF&W estimates are (Hearings, part 5, p. 2820): Starkwater: Type 1, 5,000. Types 3 and 4—18,500, Type 5—7,000. Edmore Watershed: Type 1—5,000, Types 3 and 4—25,000, Type 5—8,000.

[206] Hearings, part 5, pp. 3689, 3690.

local people have agreed to accept only limited mitigation. During project negotiations for wetlands preservation the Sweetwater-Dry Lake management district was involved in the following activities from 1965 on:

1. It spearheaded resolutions asking the Bureau of Sport Fisheries and Wildlife to discontinue opposition to drainage in the Devils Lake Basin.
2. Advised people not to sign easements or sell wetlands for wildlife over KOLR Radio Station, Devils Lake.
3. Wrote letters to Senator Burdick accusing the Bureau of Sport Fisheries and Wildlife of defeating a local drainage project.
4. Sent a letter to then Secretary Udall with an attached resolution accusing the Bureau of Sport Fisheries and Wildlife of using devious means to obtain easements.
5. Released news articles in the Devils Lake "Journal" opposing wetland acquisition.
6. Opposed extension of the wetland program.
7. Released news articles in the Devils Lake "Journal" calling for lower wetland standards in the Starkweather watershed.

In March 1972, the Interior Department said it could "make no defense" of the Starkweather project from the standpoint of "environmental soundness." [207] In its statements to the Subcommittee, the Interior Department commented on the agreement as follows: [208]

> The original goal was to preserve or compensate for 75 percent of the existing acreage of types 3 and 4 wetlands in the watershed. *Preservation terms ultimately accepted by the BSFW were significantly less than waterfowl biologists desired. Because of biopolitical pressure, however, the BSFW agreed to major compromises in the Starkweather project which allowed wetland acquisition to proceed in other parts of North Dakota.*
>
> * * * * *
>
> *It is our belief that the project should not proceed as currently planned.* (Italic supplied.)

[207] Hearings, part 5, p. 2801.
[208] Hearings, part 5, pp. 2819–2821.

In short, the agreement was a trade-off. The Bureau abandoned its efforts to protect wetlands in the Starkweather area in order to obtain the consent of the Governor (then Governor William L. Guy) to allow BSF&W to acquire lands in North Dakota, pursuant to 16 U.S.C. 715k–5, which in 1961, authorized purchase of wetlands for migratory birds with moneys from the migratory bird conservation fund only if "the acquisition thereof has been approved by the Governor of the State".

The Governor strongly supported the Starkweather project, and wanted it built. Six months before entering into the January 1970 agreement with the SCS, the BSF&W Regional Director, in a July 1, 1969, memorandum to the BSF&W Director, said "it would be desirable for the Secretary of the Interior to meet with the Governor of North Dakota to propose a means of resolving the Starkweather controversy." A by-product of any such resolution "would be to persuade the Governor to lift his moratorium on the purchase of wetlands." The Regional Director noted that "the Governor has 37 fee-purchase options on his desk covering 3,506.52 acres" outside the Starkweather area which "were sent to him" by the Bureau in April, May, and June 1969, and that the Governor "has not approved these options." Of the 37, only one was opposed by local county commissioners. The Regional Director enclosed a copy of a draft letter he was going to send to the Governor in which he referred to his May 7, 1969, meeting with the Governor and said:

> Although you cautioned us of the possibility of a moratorium on your approval of Federal wetland purchases, it was my impression that such action could be a possibility only after we could examine with you alternative solutions and then only if there was failure to agree on a mutually acceptable solution.

Thus, the former Governor moved from a threat in May 1969 of a moratorium on acquisitions of the fast-dwindling wetlands to an actual moratorium in July 1969 to pressure the BSF&W into an accommodation for Starkweather. This is certainly a misuse of the 1961 law giving the Governor veto power over Federal wetland acquisitions. When the veto provision was added in 1961, national concern for wetlands was not as great as it is today. There was, at that time, particularly in the Dakotas where most of the wetlands are, a greater concern that too much land would be taken off local tax rolls.[208a] Thus, the States were given an opportunity to review each acquisition with local officials and,

[208a] House Report 90–359, June 13, 1967, p. 7.

in appropriate cases, to veto the acquisition. The veto provision was not intended as a club to bludgeon the BSF&W into abandoning its opposition to Federal projects that would be detrimental to the purposes of the 1961 law.

The Committee therefore recommends as follows:

The appropriate committee of the House of Representatives should give consideration to repealing the veto provisions of section 3 of Public Law 87-838, as amended (16 U.S.C. 715k-5), or amending them to allow the Governor or the appropriate State agency 30 days to disapprove acquisition of any particular tract of land recommended by the Bureau of Sport Fisheries and Wildlife.

In May 1972, the Bureau's Regional Director, Mr. Travis S. Roberts, wrote to Governor Guy informing him that the BSF&W had "achieved its share of wetlands acquisition goal" within the Starkweather project as specified in the revised plan agreed upon in October 1971 between Assistant Secretary of the Interior Bohlen, the BSF&W and the Governor.[209] Mr. Roberts then said: [210]

> On behalf of the Bureau of Sport Fisheries and Wildlife and the Department of the Interior, I wish to express our appreciation for your patience and assistance in helping to achieve the mutual goals of wetland protection in the watershed. *In addition, your approval of land purchases elsewhere in North Dakota during this period has been very much appreciated.* (Italic supplied.)[211]

From an environmental standpoint, it is quite apparent that the 1970 compromise agreement and its 1971 revision were ill-advised. On more than one occasion this Committee and the Committee on Merchant Marine and Fisheries have urged that the BSF&W follow its professional judgments and refrain from making compromises that are unsound environmentally. BSF&W

[209] In October 1971, the agreement was modified, pursuant to an "understanding" reached with the Governor of North Dakota, (a) "that the Bureau of Sport Fisheries and Wildlife could acquire land along legal subdivision lines, and of whole ownerships where necessary, to facilitate purchase of land which the owner would not sell in small or 'odd lots'"; and (b) "that one-to-one credit (i.e., 1 acre credited toward the total goal for each acre purchased) would be granted for all acres acquired, including those areas which are of no particular value to waterfowl but which are acquired to block out an ownership." This was the so-called "equivalent" agreement referred to by Mr. Jahn. (P. 122, *supra.*)

[210] Hearings, part 5, p. 3048.

[211] The 1961 wetland acquisition goals of the BSF&W for North Dakota were to acquire about 1.7 million acres in fee and easement. As of June 30, 1973, the BSF&W had acquired about 650,000 acres in easement and about 175,000 acres in fee. The BSF&W estimates that over 200,000 acres in North Dakota have been drained since 1961.

still contends that "all wetlands" within the Starkweather and Edmore watersheds, regardless of type, will be affected "directly or indirectly." This amounts to about 56,000 wetland acres which will be "unprotected and subject to destruction" when the project is installed, while about 12,500 acres of wetlands "under Federal and local sponsor control in both watersheds will be protected." [212] Thus, for about every acre of wetlands protected in the watershed about 4.5 acres will probably be destroyed. This is hardly a sound compromise.

But the SCS was also a party to this agreement. It had long been eager to see the work plan approved and construction begun. In the sixties, the Federal Government's wildlife experts saw danger in the project for wildlife. They communicated their views to the SCS, the local sponsors, and others. Yet the SCS made little effort to investigate this danger. Bent on work plan approval, SCS rushed it to completion.

Prior to the 1970 compromise, the BSF&W complained about the SCS efforts to steamroll the project into fruition. The BSF&W stated: [213]

> Until early 1969, project planning proceeded at a normal pace with adequate communication among all concerned agencies and interests. On March 26, 1969, a planning progress meeting of representatives of project sponsors, the Soil Conservation Service, the North Dakota Game and Fish Department, and the Bureau of Sport Fisheries and Wildlife was held in Devils Lake, N. Dak. Definite channel routes for major drainage ditches in the benefited area were specifically identified for the first time. The Bureau was led to believe that planning would be delayed until the project sponsors could resolve wildlife preservation problems. Accordingly the preparation of a detailed report on fish and wildlife resources by the Fish and Wildlife Service was delayed with the understanding that the Soil Conservation Service would help resolve apparent differences on a local level. In July 1969, however, a meeting was called [by SCS] on short notice to review a draft work plan for Starkweather watershed. Clearly, final watershed planning had proceeded without benefit of adequate interagency coordination. Following this meeting, the Bureau completed its report entitled "A Detailed

[212] Hearings, part 5, p. 2820.
[213] Hearings, part 5, pp. 3041–3042.

Report on Fish and Wildlife Resources," hereafter re-

It was not until July 25, 1969, that the Detailed Report could be submitted to the North Dakota State conservationist of the Soil Conservation Service. By that time, the draft work plan already had been approved by project sponsors and submitted to higher authority for review. In essence, the work plan for Starkweather watershed was developed without the benefit of a reporting effort from the Department of the Interior in accordance with the intent of section 12 of the Watershed Protection and Flood Prevention Act (68 Stat. 666; 16 U.S.C. 1001 et seq.), as amended.

Then, in a marathon negotiation session on January 19, 1970, under the glare of TV cameras, SCS participated in a wetlands compromise or tradeoff that was later roundly criticized by the BSF&W professionals and others. In short, the SCS succumbed to pressures by the local sponsors of the project, tossed caution to the wind, and joined with BSF&W in a deal that offered not even half a loaf for wildlife protection.

When the Subcommittee questioned the SCS about the compromise, the SCS informed the Subcommittee that the work plan and agreement "are the results of reasoned tradeoffs that will provide a better future environment with project than without project." [214]

Assistant Secretary of the Interior Reed testified about the compromise and the Department's current position on the project at the March 1973 hearings as follows: [215]

Mr. REUSS. * * * Secretary Reed, has the Department of Interior taken a position on the environmental consequences of the proposed Starkweather channelization project of the Soil Conservation Service in North Dakota?

Mr. REED. Several positions, Mr. Chairman. It can be safely said that a number of years ago, because of the political climate in the State of North Dakota, the Department took one position.

Mr. REUSS. Which was?

Mr. REED. Which was to go along with the project and have a tradeoff, being able to acquire refuge lands and other areas of North Dakota. North Dakota, as you know, contains some of the most prized wetlands for the produc-

[214] Hearings, part 5, p. 2863.
[215] Hearings, part 5, pp. 2924–2925.

tion of waterfowl in the United States, if not the best in the United States. The only place that comes close to it is the pot-hole country of Canada.

When I came into office, I asked the Secretary very promptly whether I was bound by decisions other Assistant Secretaries and Directors of the Bureau of Sport Fisheries and Wildlife had made with the Governor of North Dakota and was told "no"—that I was to use my own judgment on all prior deals. And in good conscience, after examining the entire proposal, I could not, on the basis of competent biological advice, concur with the recommendations of the Bureau in years gone by; and I have so instructed the Bureau to notify the Soil Conservation Service. We are continuing our dialog relating to a meeting that took place last week to incorporate many of the genuine concerns of many other States downstream of North Dakota who share in the bounty of the waterfowl that come out of that State.

Mr. REUSS. The Bureau is under your jurisdicion?

Mr. REED. Yes, sir.

Mr. REUSS. They have obeyed your instructions?

Mr. REED. Yes, sir.

Mr. REUSS. And conveyed the negative view of the Interior Department to the Soil Conservation Service?

Mr. REED. That is correct.

Mr. REUSS. In a nutshell—and at the risk of oversimplifying—is one of the Department's objections the fact that one of the indirect consequences of the project could be the drying up of many thousands of areas of wetlands which are valuable for the breeding and nesting of waterfowl?

Mr. REED. Either drying up or a severe alteration so they would no longer be of such extreme value to waterfowl populations in North America. Those wetlands, those pot hole areas, produce ducks that go into the central United States and Mississippi and the Atlantic flyway. (Italic supplied.)

Mr. Reed obviously does not share the SCS view that the 1970 agreement was a "reasoned tradeoff that will provide a better future environment."

B. ONLY AFTER SCS WAS REQUIRED TO RESUBMIT ITS ENVIRONMENTAL IMPACT STATEMENT ON THE STARKWEATHER PROJECT TO CEQ DID THE INTERIOR DEPARTMENT RECOGNIZE ITS EFFECTS ON FISH AND WILDLIFE WETLANDS, AND THE DEPARTMENT THEREAFTER REPUDIATED THE 1970 COMPROMISE

SCS made scarcely a perfunctory attempt to comply with the requirements of NEPA, by filing, in April 1970, a draft impact statement on the Starkweather project stating that since the work plan "was approved prior to enactment" of NEPA, "no draft environmental statement was prepared." Section 102 of NEPA requires that SCS and other agencies, in preparing such statements, shall "consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved." The SCS failed to "consult" with the BSF&W and, despite earlier statements of the Bureau on the project's environmental impact, the SCS concluded: [216]

> Wetland preservation provision of the plan will insure the preservation of the equivalent of 13,500 acres of types 3, 4, and 5 wetlands habitat for wildlife use. Project installation will not directly offset the remaining approximately 4,000 acres of types 4 and 5 wetlands. The potential exists, however, for local interests to extend the project works of improvement to drain those wetlands acreages without Federal assistance.
>
> Channel improvements will drain 345 acres of the existing 18,000 acres of wetlands in the watershed.
>
> More than 10,000 acres of semipermanent wetlands, if not protected by easements against drainage, could be lost through on-the-farm and group drainage, once the primary laterals and major outlets are constructed.
>
> Channel work will destroy about 105 acres of grassland that provides terrestrial cover which varies considerably in type and quality, as well as quantity. In some reaches there is only a narrow band of grass, and in other reaches there may be small clumps of brush and better permanent type cover.

Fortunately, the CEQ did not accept the SCS view of NEPA, and on September 28, 1971, returned the SCS's final statement to it, stating: [217]

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[216] Hearings, part 5, p. 3051.
[217] Hearings, part 5, p. 3054.

> Sections 7 and 10(b) of the Council's Revised Guidelines on the preparation of environmental impact statements (pursuant to section 102(2)(C) of the National Environmental Policy Act) call for the preparation and circulation of draft statements for appropriate Federal, State and local comment.
>
> Your submission for a final environmental impact statement for the Starkweather, North Dakota, project appears to be not in conformity with this requirement for the filing of a draft statement.
>
> Your letter of transmittal indicates that the views of other agencies were obtained during the plan review process. However, there is no indication of when this took place nor are the comments appended to the final environmental impact statement as required by section 10(b) of the guidelines.
>
> Unless the guidelines have been complied with, I suggest you resubmit the Starkweather environmental impact statement in draft form with distribution to the relevant Federal, State, and local agencies and groups for comment.

After SCS issued its new draft statement in August 1972, the Interior Department criticized it extensively on December 4, 1972, and said that any reference to the 1970 "agreement" between SCS and BSF&W should be "deleted", and that the project would result in "a net loss of wetlands and the related waterfowl carrying capacity and production." [218]

EPA, in its comments of February 5, 1973, called the project "environmentally unsatisfactory." [219]

Dr. Stanley M. Greenfield, Assistant Administrator of EPA, Messrs. Berg and Davey of the SCS, and Assistant Secretary of the Interior Reed, testified at the Subcommittee's 1973 hearings as follows: [220]

> Mr. REUSS. * * * Your comments—EPA's comments—were negative, were they not, and indicated that the Starkweather project could be an environmental disaster?
>
> Dr. GREENFIELD. That is correct, Mr. Chairman.
>
> * * * * *
>
> Mr. REUSS. Well, now, Mr. Berg: Is it not a fact that the Soil Conservation Service is going on as if nothing

[218] Hearings, part 5, p. 3055.
[219] Hearings, part 5, p. 3071.
[220] Hearings, part 5, pp. 2925–2928.

had happened, when even those two great agencies of the Government—the Environmental Protection Agency people and the Fish and Wildlife Service people—have pronounced it a disaster? Despite these pronouncements, SCS, for some reason known but to God, is going ahead.

* * * * *

Mr. BERG. Mr. Chairman, the project, although approved prior to January 1, 1970, has yet to have any construction activity. It has a long history, as we do have some excellent work that has been done cooperatively with all of the concerned groups and the local sponsors of that particular project to try to reach an agreement that will satisfy the objections that have been raised by various groups.

* * * * *

Mr. REUSS. Welcome, Mr. Davey. Would you tell us how you are going to modify a project which is going to result in the modification of thousands of acres of wetland and the destruction of the finest waterfowl habitat on the continental United States so that you can satisfy the EPA on pollution and Interior on waterfowl protection?

Mr. DAVEY. * * * We attempted an environmental impact statement which turned out to be rather weak, particularly because we did not have much experience, or even very much in the way of guidelines, at that stage of the game.

We have developed a draft environmental impact statement, to which EPA and Interior and other groups have commented and expressed very much concern.

Mr. REUSS. Well, is that not the one which caused EPA and Interior to say that your project is a disaster and should be abandoned forthwith?

Mr. DAVEY. Yes, sir; they expressed many concerns.

Mr. REUSS. Why don't you abandon it?

Mr. DAVEY. Many of these concerns, we feel, can be accommodated and some of them are based, in our opinion, on differences of interpretation of the data. Most of the watershed is already cropland now, and this is a problem that most people do not seem to fully understand.

Mr. REUSS. Is that a reason for blocking up the remaining bits of wetlands and wildlife habitat?

Mr. DAVEY. Well, in our judgment it will not. There

are, obviously, people who have other views on this but, in our judgment, it will not blot out all of the rest of these. Our meeting last week with Interior was to surface the specific issues. What we have in mind doing is issuing a revised draft environmental statement, which we hope addresses these concerns. We would like to have the input of the Bureau of Sport Fisheries and Wildlife, EPA, and others in developing this revised statement.

* * * * *

Mr. BERG. Mr. Chairman, the watershed work plan does state that: "There shall be no construction on Starkweather watershed project until all preservation methods to compensate for wetland losses are fulfilled." There have been dramatic advances made already in regard to some of the things that need to be achieved.

Mr. REUSS. Is there lurking in the mind of the Soil Conservation Service the hope that maybe Mr. Reed and Dr. Greenfield will go away and that you will get somebody else in their position who can be wooed into saying "OK"?

Mr. BERG. No.

* * * * *

Mr. REED. * * * *I think it will take more than bandaids to fix this project up to make it*—to recognize the tremendous national involvement in this area. * * * the waterfowl that come out of this area go to numerous other States across many borders and many boundaries.

DR. GREENFIELD. *I certainly agree with what Mr. Reed says, and to add to it, I would just say that there are significant potential water quality problems with this project that you do not fix up very easily.* You have downstream effects with which you must be concerned. If you increase the velocity of these waters, and also increase the use of the land around them, then you get the pesticides and other chemicals flowing off. If you take away the wetlands and their ability to purify the water, and dump all of these waters quickly in the channel and move it downstream, you are just pushing the pollution problem further downstream, so it is difficult to take care of the associated impacts.

In addition, if you consider just Starkweather, without worrying about the rest of that drainage basin, then

> you are also in trouble because the whole area is hydrologically connected—which gives rise to a whole series of problems. (Italic supplied.)

The Committee also doubts that this project can "be fixed up" merely by working up a new impact statement, or by applying "bandaids" to patch it. It should be shelved until the wetlands and water quality problems are resolved and then a new economic analysis will be needed to see if the benefit-cost ratio supports going ahead. As presently conceived, it should be abandoned.

On July 25, 1973, Under Secretary of the Interior John C. Whitaker informed Secretary of Agriculture Butz that the BSF&W and SCS met on May 30, but without any EPA representatives, in an effort "to come to a meeting of the minds" on making the project "environmentally sound." Noting that the effort was not "fruitful," Under Secretary Whitaker said that until a "full reevaluation" of the project occurs, "there is no course open to us except to reiterate" the Interior Department's opposition to the project "as currently proposed." In an August 16 reply, Secretary Butz said, without agreeing or disagreeing on such a reevaluation, that SCS is "taking another look at the many factors involved in this complex situation."

It would appear that future discussions concerning this project should include representatives of EPA and State fish and wildlife and water quality agencies, and that the public should be given an opportunity to comment on any proposed agreement between the agencies.

XIV. IN DECEMBER 1972, THE PRESIDENT TERMINATED THE WATER BANK ACT PROGRAM, UNDER WHICH LANDOWNERS RECEIVED INCENTIVE PAYMENTS TO PRESERVE WETLANDS AND MIGRATORY WATERFOWL HABITAT. HIS ACTION WAS CONTRARY TO LAW AND HAS BEEN REPUDIATED BY BOTH THE HOUSE AND THE SENATE

On December 19, 1970, President Nixon approved the Water Bank Act (16 U.S.C. 1301–1311) which authorized the SCS to enter into 10-year agreements to make annual payments to landowners and operators in important migratory waterfowl nesting and breeding areas for the conservation of types 3, 4, and 5 wetlands. On May 2, 1972, the SCS initiated payments under the program, and, at the same time, the Agriculture Department issued a final environmental impact statement which said: [221]

[221] Hearings, part 5, pp. 3157–3158.

This program will help prevent the serious loss of wetlands in the Nation and thus conserve surface waters; preserve nesting and breeding habitat for migratory waterfowl and other wildlife resources; reduce runoff; reduce soil and wind erosion; contribute to flood control; and retain natural water impoundments and subsurface moisture.

The retention of wetlands will slow eutrophication of lakes and streams benefiting future fisheries management and water-based recreational pursuits. Wetlands function as natural filters of soil particles and nutrients. Vegetation in wetlands filters out soil particles and ties up nutrients such as phosphate, that otherwise would end up in the lakes and streams. Phosphate is the key nutrient involved in algae blooms, which create aquatic nuisance problems in many lakes. Eutrophication will therefore be slowed when soil particles and nutrients are retained in wetland basins. Also, type IV and V wetlands directly associated with lakes function as important fish spawning areas, particularly for northern pike. Retention of these wetlands will insure maintenance of key fish spawning areas necessary to maintain a quality sport fishery.

The payments under the program will result in an economic stimulus to the participants and, in some instances, those areas selected for the program to be offered. The multiplier effect and the accumulation of secondary effects are estimated to result in an economic impact on the economy somewhat greater than the total annual payments made under the program agreements. Some of these benfits will accrue from the improved recreational activities associated with stabilized or increased production of migratory waterfowl and other wildlife. The program will be of some economic stimulus to local agricultural-related businesses providing the services in carrying out the conservation measures under the agreement. (Italic supplied.)

The Interior Department, in its comments on an earlier draft impact statement, wrote to the Administrator of the Agricultural Stabilization and Conservation Service on April 17, 1972, about the value of wetlands, as follows: [222]

It seems appropriate to add that retention of wetlands

[222] Hearings, part 5, pp. 3159, 3160.

will slow eutrophication of lakes and streams. Wetlands function as natural filters of soil particles and nutrients. Phosphate is a key nutrient in aquatic nuisance problems in many lakes and retention of such nutrients that would otherwise end up in lakes and streams will tend to slow the eutrophication process.

The positive value wetlands provide in reducing algae in lakes and streams is believed considerably greater than recognized by the [impact] statement. The assumption of algae production in wetlands as an adverse effect of significance is incorrect. In wetlands themselves, algae production is not a serious problem. The favorable depth, soils, and periodic drying of natural wetlands encourages the growth of many aquatic plants that effectively compete. And algae and mosquitoes both are important elements in the food chain that supports a variety of animal life.

Type IV and V wetlands directly associated with lakes also function as important fish spawning areas. To maintain a quality sport fishery like northern pike, for example, requires the retention of key wetland areas.

* * * * *

Wetlands actually have a relatively high rate of evapotranspiration and hence water loss. Where run off is important, totals are reduced. Peak flows downstream will probably also be lower downstream from a wetland area than they would if the area were developed, but as a result of increased surface storage rather than evapotranspiration. The effect of wetlands upon low flows is complex, probably differing from area to area as well as seasonally. Wetlands should decrease low flows during periods of high evapotranspiration. During periods of negligible evapotranspiration, the effect of such storage will probably be to increase low flows.

* * * * *

Reference is again made to the questionable nature of the adverse effect noted earlier for algae concentration and mosquitoes as a nuisance in retained wetlands. Many times more favorable mosquito conditions are caused by draining wetlands for other uses than by retaining them. The *Aedes sp.*, which is most common to the prairies, requires wet soils that are subjected to temporary flooding. Favorable mosquito breeding condi-

> tions many times are created when wetlands are drained for agricultural use, but water still covers the basin for short periods of time in the summer and increases mosquito production. Therefore, retention of wetlands may actually reduce potential mosquito problems and this should be recognized as a positive value in the statement.

On March 30, 1972, the SCS announced that 17 States would participate in the new program in 1972. The program included Cavalier and Ramsey Counties in North Dakota where the Starkweather project is located.[223] Several months later, in October 1972, the SCS announced that 62 counties in 15 States—again including Cavalier and Ramsey Counties—"would participate in the 1973 water bank program which is aimed at helping preserve waterfowl habitat in areas where it is rapidly disappearing".

However, the F.Y. 1973 program never got started. On December 26, 1972, only two months after it was announced, the President terminated this program and "impounded" over $11 million of the funds appropriated by Congress for the F.Y. 1973 program. This time, Secretary of Agriculture Earl L. Butz, in a statement released to the press, labeled the program as "unnecessary since the Department of Interior administers similar programs to enhance and conserve migratory waterfowl".

But the Water Bank program was intended to supplement Interior's program, which has never been adequately funded, as noted in the following colloquy at the Subcommittee's 1973 hearings: [224]

> Mr. REUSS. Are you not really giving the wetlands and waterfowl interests a double whammy here? You are completely cutting out the program to pay farmers to preserve their wetlands and you are going full speed ahead with the program to blot out further wetlands which are very costly in taxpayers' dollars. How can you justify your action?
>
> Mr. BERG. I cannot speak for the budget requests of the Department of the Interior but I believe their program is suggested for continuation. This activity in the Department was always to be a supplement at a very low level of financial output compared to their programs.

[223] Hearings, part 5, p. 3152.
[224] Hearings, part 5, p. 2936.

Mr. REUSS. Well, let me ask Mr. Reed: Is it not a fact that the Interior Department's program is necessarily quite an expensive land acquisition program; that it is drastically underfunded; and that the beauty of the Agriculture Department's water bank program was that it kept land ownership with the farmer and simply paid him a modest fund to serve the public interest by keeping it in wetlands?

Mr. REED. It was an extremely useful tool combined with the purchasing power of the duck stamp money, an advance authorization of the Wetland Act authorized by the Congress some years ago. They were good tools.

Testimony by SCS Associate Administrator Berg and by Assistant Secretary of the Interior Nathaniel Reed at the Subcommittee's March 1973 hearings illustrates the downgrading of environmental values implicit in the Administration's termination of the Water Bank program: [225]

Mr. MCCLOSKEY. * * *

Can you tell me why the Secretary terminated the entire water bank program in December?

Mr. BERG. This program was new. It was operating in its second year and it was determined, in evaluating several programs that were of a lower priority, that this was one that in the interest of holding down our financial outlay, stopping the pressures on the Nation's economy from this kind of work, and shifting the emphasis to the farmer's ability to do this on his own, based on the income that he is receiving in the market place; that this was one program that could be borne by non-Federal sources.

Mr. MCCLOSKEY. This is not just an impoundment matter; this is a matter where the Secretary terminated the program entirely, is it not?

Mr. BERG. Yes.

* * * * *

The greater priority in this particular instance in terms of the decision not to go forward with this program was on the basis of concentrating on agricultural programs that generate, rather than supplement, incomes; and it is on that basis that the actions taken on December 28, 1972, were to terminate approvals of applications for benefits under this particular legislation.

[225] Hearings, part 5, p. 2933.

Termination by executive fiat of programs established by Congress is clearly contrary to the constitutional mandate that the President "shall take care that the laws be faithfully executed". In *Youngstown Sheet & Tube Co.* v. *Sawyer,* 343 U.S. 579, 587–589 (1952), the Supreme Court stated:

> In the framework of our Constitution, the President's power to see that the laws are faithfully executed refutes the idea that he is to be a lawmaker. The Constitution limits his functions to the recommending of laws he thinks wise and the vetoing of laws he thinks bad. And the Constitution is neither silent nor equivocal about who shall make laws which the President is to execute.
>
> * * * * *
>
> * * * The Constitution does not subject this lawmaking power of Congress to Presidential * * * supervision or control.
>
> * * * * *
>
> The Founders of this Nation entrusted the lawmaking power to the Congress alone in both good and bad times.

Congress enacted and the President approved the Water Bank Act of 1970. It thus became the law of the land. Pursuant to the President's budget requests for F.Y. 1972 and F.Y. 1973, the Congress affirmed the program by appropriating $10 million to fund it for each of those years. When the President terminated the program in December 1972 by impounding the unobligated funds (then amounting to $11,390,820 available in F.Y. 1973), he attempted in effect to legislate the termination of the entire program even though the Congress had not declared that it shall end.

Judge William B. Jones, in *Local 2677* v. *Phillips,*——F. Supp.——(D.D.C., April 11, 1973), ruled that the President lacks the constitutional power to terminate an entire program enacted by Congress. He said:

> Article I, section 1, of the Constitution vests "[a]ll legislative powers" in the Congress. No budget message of the President can alter that power and force the Congress to act to preserve legislative programs from extinction prior to the time Congress has declared that they shall terminate, either by its action or inaction.
>
> * * * * *

> An authorization does not necessarily mean that a program will continue. Congress, of course, may itself decide to terminate a program before its authorization has expired, either indirectly by failing to supply funds through a continuing resolution or appropriation, or by explicitly forbidding the further use of funds for the programs, as it did in the case of the supersonic transport. But Congress has not chosen either of these courses, although it may in the future. Until that time, historical precedent, logic, and the text of the Constitution itself obligates the defendant to operate the * * * programs as was intended by the Congress, and not terminate them. (Footnotes omitted.)

Both the House and the Senate rejected the President's action, when they acted on the Agriculture-Environmental and Consumer Protection Appropriation bill for F.Y. 1974 (H.R. 8619). The House Appropriations Committee stated in its report on the bill (H. Rept. 93–275, p. 80; June 12, 1973):

> The Committee directs that this [Water Bank Act] program be reactivated and that the unobligated funds in the amount of $11,390,820 available in fiscal year 1973, which will carry over to fiscal year 1974, be used to fund the program.

The bill was passed by the House on June 15, 1973 without any change in this recommendation. The Senate Appropriations Committee went even further. It recommended (S. Rept. 93–253, p. 57; June 26, 1973) an additional $10 million, which with the $11,390,820 of unobligated F.Y. 1973 funds, will provide a "total program of $21,390,820" for F.Y. 1974. The Senate Appropriations Committee explained its views as follows (pp. 57, 58):

> The Committee recommends restoration of the Water Bank Program which was one of the many significant and highly beneficial programs terminated by unilateral executive action in December of 1972. The Committee is at a complete loss to understand or comprehend the rationale for terminating this program. While relatively new and certainly modest in scope, it was nevertheless a high priority program so far as Congress and the Nation are concerned.
>
> The reasons advanced by the Administration for terminating this program are unconvincing and unrealistic, and there appears to be some degree of confusion within the Administration as to the relative merits of this

> program. Less than three months following the announcements of its termination within the Department of Agriculture the Environmental Protection Agency announced a new program for the protection and preservation of the Nation's wetlands. The Committee concurs with a statement made by EPA Administrator Ruckelshaus at that time when he announced publicly that:
>
> "Wetlands are unique recreational areas, high in aesthetic value, that contain delicate and irreplaceable specimens of fauna and flora and support fishing as well as wild fowl and other hunting."
>
> Congress obviously recognized these facts in establishing the Water Bank Program. This Committee likewise has recognized the facts in funding the program since its inception. The Committee now calls upon the Department to recognize these facts and to proceed with administering this law pursuant to the legislative mandates of the Congress as contained in the authorizing legislation and the recommendations of this Committee in providing funds for this purpose.

The Senate passed the bill on June 28, 1973, in accordance with the foregoing Committee recommendation, and on September 20, 1973, the House-Senate Conferees adopted the Senate version (H. Rept. 93–520, p. 23).

The termination of the Water Bank program has aggravated the problem of wetland drainage resulting from channelization projects. While a resurrected Water Bank program will not, and was never intended to, prevent the SCS or the Corps from carrying out their channelization projects, it will help to preserve many wetlands that might otherwise be drained. Such preservtion of wetlands would most certainly be in the national interest.

XV. THE NATION'S FLOOD LOSSES CONTINUE TO INCREASE DESPITE THE EXPENDITURE OF BILLIONS OF DOLLARS SINCE 1936 TO CONSTRUCT FLOOD CONTROL STRUCTURES. INSUFFICIENT ATTENTION HAS BEEN GIVEN TO REGULATING FLOOD PLAIN AREAS IN ORDER TO REDUCE FLOOD LOSSES

On August 10, 1966, President Johnson transmitted to Congress the report of a task force established to study Federal flood control policy (*supra*, footnote 5). President Johnson noted that despite expenditures of over $7 billion by the Federal Government in the previous 30 years, the Nation's annual flood damage costs of

over $1 billion continued to increase. He stated: "The key to resolving the problem lies, above all else, in the intelligent planning for the State and local regulation of use of lands exposed to flood hazard." (P. III.)

The task force report gives some inkling as to why these costs continue to mount. It states (pp. 9,11,14):

> The major purpose of engineering projects is changing from the protection of established property to the underwriting of new development. Increasingly, Federal funds are used to support projects justified on the basis of protection of lands for future use. This is illustrated by the contrast in the benefit base between Corps of Engineers projects authorized in the Flood Control Act of 1941 and the Flood Control Act of 1965. A similar trend is found in approved Soil Conservation Service flood prevention and watershed protection projects.
>
> * * * * *
>
> Studies of flood plain use show that some flood plain encroachment is undertaken in ignorance of the hazard, that some occurs in anticipation of further Federal protection, and that some takes place because it is profitable for private owners even though it imposes heavy burdens on society. Even if full information on flood hazard were available to all owners of flood plain property (a service now conspicuously lacking) there still would be conscious decisions to build in areas where protection has not been feasible, for the private owner may not perceive the hazard in the same way as the hydrologist and he does not expect to bear all the costs of his use of hazardous property. Moreover, the chief encouragement he now receives under Federal programs is the prospect for relief or future Federal protection. Technical assistance in developing alternative ways of dealing with flood losses, as by floodproofing, is not provided. Consequently such means receive little attention. Similarly, alternative uses for flood plains are not thoroughly canvassed.

The day President Johnson transmitted this report to Congress, he also issued Executive Order 11296 of August 10, 1966 (3 CFR, 1966–1969 Comp., 571), which directs Federal agencies to "provide leadership in encouraging a broad and unified effort to prevent uneconomic uses and development of the Nation's flood

plains and, in particular, to lessen the risk of flood losses in connection with * * * federally financed or supported improvements." However, according to the National Water Commission's report of June 1973,[226] "this is not being done." In fact, guidelines for applying the 1966 Executive order were not developed until the Water Resources Council issued its guidelines in April 1972.[227]

When the Subcommittee asked the construction agencies about the extent to which each was complying with the Executive order, the Bureau of Reclamation and the SCS rather vaguely responded as follows:

> The Bureau of Reclamation said: [228]
>
> Reclamation is complying with Executive Order 11296. Where portions of the flood plain have been leased to the public for marinas or golf courses, the major facilities must be constructed so that they will not impede flood flows or float downstream; removable facilities must be removed upon notice of an impending flood; bypass channels may be required; major structures are restricted to areas as high or higher than the levees.
>
> The SCS said: [229]
>
> Where urban protection is an objective of a project, our policy requires that it be planned to protect existing residential, commercial and industrial parts of the urban areas from at least the 100-year frequency flood. When this objective cannot be met, care must be exercised to assure that a false sense of security does not lead to unwise development of the flood plain. In order to prevent this, where the project will provide less than 100-year frequency protection, we require that the work plan shall include several provisions to prevent unwise development. These provisions are:
>
> (1) A thorough description of the remaining flood hazard.
>
> (2) A map showing the area expected to be flooded by the 100-year event after the project is installed.
>
> (3) Provision for the local sponsoring organization to publicize, at least once annually, the nature and extent of the hazards remaining in those areas subject to flooding by the 100-year event.

[226] Footnote 4, supra.

[227] Water Resources Council, "Flood Hazard Evaluation Guidelines for Federal Executive Agencies."

[228] Hearings, Part 5, p. 2816.

[229] Hearings, Part 5, pp. 2854–2856.

(4) Provision for the sponsoring local organization to prevent, to the extent possible, reconstruction and development in the area subject to flooding by the 100-year event.

In several cases where work plans for watershed projects include protection for urban or urbanizing areas, we have required that the work plans include provision for flood plain land use controls. Our primary objective in this requirement is to prevent reconstruction or development in areas subject to flooding by the 100-year flood and thereby preclude unwise, hazardous, and uneconomic development of the urban flood plains.

The 1966 task force report, however, did stimulate enactment of the National Flood Insurance Act of 1968 (42 U.S.C. 4001, et seq.). Under this Act the Federal Government provides flood insurance in cooperation with the private insurance industry. Even more significantly, the Act has encouraged State and local governments to adopt laws and ordinances restricting the use and development of land exposed to flood hazard. As of August 31, 1973, 2,467 communities in all 50 States and Puerto Rico had qualified for the flood insurance program by adopting land use and control measures required by the Department of Housing and Urban Development (24 CFR 1910, Subpart A) pursuant to the National Flood Insurance Act. More than 282,000 policies, with almost $5 billion insurance coverage, are now in force.

The scope of this Act would be substantially expanded by a bill (H.R. 8449) passed by the House on September 5, 1973. This bill, the Flood Disaster Protection Act of 1973, would not only increase the existing limits of insurance coverage but also prohibit any Federal "financial assistance for acquisition or construction purposes" after December 31, 1973, for any area or community having special flood hazards unless the building to which the financial assistance relates is covered by flood insurance. In addition, all banks and savings institutions regulated by the Federal Government would have to require flood insurance on all improved real estate in such areas as a condition to making loans on property within flood hazard areas.

Other recent significant developments in tackling the problem of flood damage were the publication of (a) the Water Resources Council's 2 volume study entitled "Regulation of Flood Hazard Areas to Reduce Flood Losses" (vol. 1, December 1971; vol. 2, December 1972); and (b) the Corps of Engineers' detailed study entitled "Flood Proofing Regulations" (June 1972), to provide

guidance to the public for developing flood proofing building standards which could be adopted by State and local governments.

These excellent steps to help reduce the Nation's annual flood damage bill herald the increasing shift from the former reliance on the strictly structural techniques of building dams and levees, and channelizing streams, to more diverse alternative methods for combating flood hazards. Much more study and effort on these alternative methods is needed. The public today is concerned as much about environmental damages as about floods. The day has come for requiring that prevention or maximum reduction of both environmental damages and further development within a flood prone area be assured before a water resource project is constructed within it. In many cases, the use of nonengineering alternatives for reducing flood damages, such as the strict regulation of flood plain development, flood insurance, etc., will make unnecessary the construction of dams, levees and channelized streambeds which inflict substantial environmental damages.

The Fourth Annual Report of the CEQ (September 1973), which noted (p. 313) that flood losses "now amount to a national average of almost $2 billion annually," has stressed the importance of these alternatives as follows (p. 314):

> There can be little question, however, that there are many locations where millions of dollars could be saved by locating high-value industrial, commercial, and residential developments outside the flood plain and developing the land along the rivers for parks and other low-density uses.

ADDITIONAL VIEWS OF HON. JACK BROOKS (CONCURRED IN BY HON. L. H. FOUNTAIN AND HON. JIM WRIGHT)

Land is a previous natural resource and one that must be carefully safeguarded. The pressures of a growing population and a vastly increased mobility in recent years have made us aware that this valuable commodity is available only in limited quantities and that it must be utilized efficiently and preserved to the maximum extent possible.

Undoubtedly, there have been occasions where unnecessary or badly planned stream development has occurred. However, it must also be appreciated that life, property, and commerce have been enhanced in all parts of our Nation through enlightened public works projects, including channelization, in many instances. Well planned projects which give consideration to all aspects of

stream modifications—benefits as well as losses—have greatly benefited our Nation's people.

Conservation of our natural resources is an essential task. Wise conservation, however, does not preclude appropriate stream development as a legitimate means of improving flood control, drainage, navigation, and erosion prevention. Channelization has long been recognized as an effective flood control instrument when wisely used. This committee report should not be taken in any way as a condemnation of channelization, but rather as recognition by the committee that every effort must be made to preserve the natural environment to the maximum extent possible wherever these vital public works projects are carried out.

JACK BROOKS.

We concur in the additional views of Congressman Jack Brooks.

L. H. FOUNTAIN.
JIM WRIGHT.

4.7b REPORT TO CONGRESS ON WATER POLLUTION CONTROL MANPOWER DEVELOPMENT AND TRAINING ACTIVITIES, ENVIRONMENTAL PROTECTION AGENCY DECEMBER 1973.

Dear Mr. President:

I have the pleasure to forward herewith a Report to Congress on Water Pollution Control Manpower Development and Training Activities. The Report is submitted pursuant to Section 104 (g) (4) of the Federal Water Pollution Control Act.

Sincerely yours,
Russell E. Train

Honorable Gerald R. Ford
President
United States Senate
Washington, D.C. 20510

Enclosure

CONTENTS

LIST OF EXHIBITS

PART I. INTRODUCTION

A. PURPOSE AND SCOPE OF THIS REPORT

1. *Authority*—Subsection 104(g)(4) of Public Law 92–500 dated October 18, 1972, requires that: "The Administrator shall submit, through the President, a report to the Congress not later than December 31, 1973, summarizing the actions taken under this subsection and the effectiveness of such actions and setting forth the number of persons trained, the occupational categories for which training was provided, the effectiveness of other State and local training programs in this field, together with estimates of future needs, recommendations on improving training programs, and such other information and recommendations, including legislative recommendations, as he deems appropriate."

2. *Scope of Report*—This report has been prepared as a supplement to EPA Report to the Congress, Number 92–36, dated March 1972, pertaining to water pollution control manpower and development training activities. In this supplement, special emphasis is placed on the potential impact of Public Law 92–500 relative to manpower and training program activities. The original EPA Report to the Congress, is to be considered as the primary source document relative to EPA manpower development and training program strategies and activities and programmatic findings, conclusions and recommendations predicated on manpower demand and supply and other factors unless otherwise specified by information contained in this supplement.

B. MANPOWER—IMPLICATION OF PUBLIC LAW 92–500

The 1972 Amendments are considered to be the most extensive and far reaching legislation ever enacted at the Federal level pertaining to water pollution abatement and control. The law sets the stage for a coordinated series of actions that must be taken within stringent guidelines and enforcement provisions by both federal, state, and local governments and industry.

Summarized below are some of the more important requirements of the legislation, all of which impact on current and future manpower and training needs.

1. Federal construction grant authorizations have been significantly increased for municipal water pollution control in order to assist local communities to build wastewater treatment plants and systems.

2. Additional funds are authorized in the legislation, totalling two and three quarter billion, to reimburse local governments for treatment plants constructed prior to the enactment of the current bill.

3. The Federal Government share for providing funds for construction is 75% in lieu of the 55% under old legislation.

4. At least "secondary" treatment will be required for municipal plants constructed prior to mid-1974 and best practicable treatment will be required for plants constructed after that time. (All treatment plants must provide a minimum of secondary treatment by mid-1977).

5. Area wide waste treatment management plans will be required to be devised by mid-1976 in areas where significant water pollution control problems exist.

6. *Industrial Pollution:* (a) industries will be required to pretreat

[p. 2]

effluents before they are discharged into the municipal treatment systems; (b) industries will be required to have the best practicable control technology by mid-1977 and the best available by 1983; and (c) discharge of toxic pollutants listed by EPA must meet effluent standards to be promulgated by mid-1974.

7. *States:* The overall framework for management of state water quality planning is delineated in the new legislation under Sections 303(e), 208 and 201. The state wide water quality planning required by Section 303(e) is the central tool of the states in administering their water quality programs. The planning process provides direction to resource expenditures to the

establishment of priorities and appropriate schedules of action. It also provides the goals and framework for construction grant planning in area-wide planning required by Sections 201 and 208. These management processes are designed to achieve maximum effectiveness from state water pollution control programs. The following are indicative of some of the responsibilities or opportunities for the States: (a) states must adopt water quality standards for interstate waters and periodically report on the quality of their waters within their borders; (b) states are required to submit reports on non-point sources of pollution and establish and recommend various control programs; (c) states must submit an annual water quality inventory; (d) states may issue permits (if not, EPA will issue the permits) which require that no source can discharge any pollutant into any waterway of that state without permission of that State; and (e) all states, regardless of the permit issuing authority, will periodically inspect facilities in order to assure adherence to the permit application requirements and to take action where operations and maintenance result

[p. 3]

in violations of discharge limitations. These programs are expected to stimulate more comprehensive state programs in operations and maintenance as well as the administration and enforcement of state operator certification programs. It is also expected that states will develop and administer effective training programs for all levels of personnel in water pollution to assure abatement and control success.

8. *Municipalities*: Water quality, effluent limitations and permit compliance requirements will require many local communities to provide for more stringent operation and maintenance procedures and practices including: (a) additional manpower for 24-hour-a-day waste treatment plant operation; (b) additional record keeping, particularly test results and other efficiency elements; (c) additional and more complex water analysis testing procedures to assure maximum plant efficiency and proper effluent discharge (automatic monitoring and sampling equipment will necessitate new operator/technician skill and knowledges) and (d) adoption of user charges to pay the costs of operation and maintenance.

9. *Federal Activities*: (a) the Federal Government, including EPA, is expanding its programs in accordance with the new legislation. (Federal facilities, under Section 313 of the Act, must comply with federal, state and interstate and local water pollu-

tion control and abatement requirements to the same extent that any person is subject to such requirements). (b) Federal agencies having water pollution control facilities must meet the higher water quality standards and effluent limitations. (c) Agencies may be expected to provide for more extensive training of their personnel

[p. 4]

in order to improve their treatment operations; and provide for possible certification of operator personnel within the state. (d) EPA, with the assistance of the states must provide for: A system of permit issuance including a system of surveillance, monitoring and enforcement; the establishment of water quality standards and effluent limitations; the development of new technologies, and the issuance of guidelines for proper operations and maintenance; for the development of training programs; and for numerous activities, including the abatement and control of other sources of water pollution control such as: agricultural, rural, thermal, oil and hazardous material dumping and spillage, sedimentation, acid mine drainage, etc.

C. Conclusions

1. From information gathered during FY-73, implementation of the 1972 Amendments to the Federal Water Pollution Control Act indicates that a greater number of new personnel and additional numbers of better trained personnel must be available to the federal, state and local sectors than initially estimated in the 1972 Manpower and Training Report to the Congress. Such increases are attributed to intensified waste treatment plant construction, more stringent water quality standards and effluent limitations, increased regional, state and local planning requirements and the administration and enforcement of a "permit" program.

2. EPA water training programs continue to satisfy at least in part the unmet needs of various employer groups and their employees in numerous occupational categories (professional, operator and technician) who constitute the existing or potential manpower pool required to control water pollution.

[p. 5]

3. Emphasis continues to be placed on having the state and local water pollution control agencies define manpower and training needs of their jurisdictions through the establishment of manpower planning capabilities and meet these needs through

their established educational institutions. Further efforts to extend and intensify operation and maintenance training will be important elements.

4. (a) The current supply of professionals (scientists and engineers) qualified in water pollution control cannot fill the technical requirements of the field under present circumstances. Demand will continue particularly for sanitary, chemical and civil engineers as a result of increased waste treatment plant construction, more stringent water quality standards and effluent limitations. To the extent that financial support to professional training programs at the graduate level is of interest, EPA, through its Training Grants Program, has been one source of funds.

(b) The EPA Undergraduate Training Grants and Scholarship Program has been operating to satisfy some of the unmet needs for entry training of senior level technicians and operators. EPA has developed a program of Agency fellowships for professional employees of state and local agencies for special training programs unrelated to degree programs, to fulfill some of the demand for a management training need which results from the new requirements of the 1972 Act.

5. (a) Waste treatment plant operator training (entry and upgrade) remains an important element as a result of increased plant construction,

[p. 6]

effluent limitations, and the need to bring plants to efficient operation and as near "design" capacity to meet EPA Permit Program water quality requirements. A 1973 study by the Municipal Waste Water Systems Division of EPA's Office of Water Program Operations on the effectiveness and efficiency of existing treatment plants, indicates serious impairments by under-staffing and under-training of operation and maintenance personnel (see Clean Water Report to the Congress 1973 (pages 43–46). Particular emphasis needs to be placed in training "higher skilled operators" in activated sludge techniques, digestion, process control, instrumentation, etc., in order to meet secondary treatment standards called out by the new legislation.

(b) More highly trained technicans will be required in the future as compared to the substantial majority of technicians today. Update training of these technician personnel has become increasingly more important as a result of reporting requirements outlined under the National Pollution Discharge Elimination Sys-

tem. The system requires performing complex water analysis tests and reporting within strict time intervals.

6. EPA will be required to place additional emphasis on determining national manpower training needs relative to other sources of water pollution, i.e., thermal sources, feedlots, various other agriculture wastes, mine drainage, oil and hazardous materials, sedimentation/erosion, and watercraft wastes.

7. Technological developments will continue to affect the need for more training. (a) New water pollution control equipment and processes

[p. 7]

for municipal operations in conjunction with effluent limitations through state "permit" programs will dictate a higher caliber operator for the treatment system. (b) Surveillance technology will introduce automated sampling, chemical analysis procedures and more complex instrumentation for water analysis. (c) Management in state and local governments will be required to be aware of technological improvements and alternative solutions to achieve improved water quality.

8. The EPA Direct Technical Training Program presently provides a wide variety of activities to fill the technology gap. Increased skill and knowledge requirements of personnel at all levels of federal, state and local government, industry and education resulting from new legislative mandates, dictate an intensified technical training effort.

[p. 8]

PART II. MANPOWER AND TRAINING DETERMINATIONS

These data have been extracted from the EPA Report to Congress, Number 92–36, March 1972, and are to be considered as estimates, which are conservative in view of the recent water quality legislative requirements under Public Law 92–500. Despite certain data limitations discussed in the 1972 report, however, the forecasts are considered indicative of the order of magnitude of the manpower and training needs since some consideration was given to proposed legislation at that time. Future potential changes to these data resulting from further analysis of the impact of the 1972 Water Act Amendments and new assessment information will be outlined in the text of the report that follows.

Water quality personnel with a wide variety of skills are

needed to perform these functions. For purposes of this report, they are categorized into four overall groups: professionals, technicians, operators, and others.

1. *Professionals*

Into the professional category fall those jobs that require creative problem-solving; the professional is expected to deal with analysis and correction of unusual management or technical problems.

[p. 9]

Sanitary engineers are the predominant professionals in the field. The professional category also includes civil, electrical, and mechanical engineers and architects who design and construct facilities, chemical engineers who design and modify treatment processes, and mechanical and electrical engineers who design and operate the electrical and materials handling systems in the larger wastewater treatment facilities and the sewage collection systems.

In addition to engineers the professional category includes scientists who are involved in research, monitoring, and technical supervision. Chemists and microbiologists engage in water analysis in facilities and in streams, while aquatic biologists analyze the effects of pollution on water life.

Recently, as the interdisciplinary impact of water pollution control has become more apparent, other professionals have become more closely identified with the field. For example, lawyers, economists, and political scientists are frequently involved in enacting and administering water quality legislation, and management specialists and computer specialists have joined with engineers and scientists to provide interdisciplinary teams to solve water quality problems.

[p. 10]

2. *Technicians*

The technician performs complex but routine analytical tasks which require a knowledge of engineering and/or scientific techniques. This category consists largely of wastewater treatment laboratory technicians who perform chemical and biological tests to analyze influents, treatment processes, and effluent characteristics. Particularly large or sophisticated water and/or sewage utilities also utilize electronic technicians to work with telemetry and automated control systems. Other technician level personnel include the draftsmen and survey party personnel who work with

the consulting engineering firms and large municipal departments.

3. *Operators*

The operator manpower category includes several levels of personnel who are directly responsible for operation of equipment and systems involved in treating wastewater. The lowest grade of operator is an entry-level job. These operators may have less than a high school education and may have little mechanical experience.

The second grade of operators include those who are more experienced and are responsible for operations of part of the plant, or possibly a small plant in its entirety, including the indoctrination of new operators.

The third level of operator includes supervisory personnel such [p. 11]

as shift supervisors and plant superintendents who have ultimate operating responsibility for effectively running a plant.

4. *Others*

Other categories include the craftsmen (such as electricians, mechanics, and machinists) who are required for maintenance of wastewater treatment plants; the laborers who support the operators and craftsmen; and clerical and administrative personnel.

Although the nature of plant operations gives maintenance jobs a number of unique characteristics, personnel fulfilling the maintenance function generally require standard craft skills. Heavy equipment operators, mechanics, and bricklayers are needed for sewer collection system operation and maintenance. [p. 12]

EXHIBIT I
MANPOWER ENGAGED IN WATER QUALITY ACTIVITIES—FY 71
SECTORS

Personnel category	Non-governmental	Local	State	Federal*	Total
Professional	13,200	4,300	2,100	5,800	25,400
Operator	15,400	29,700	—	4,200	49,300
Technician	20,500	4,000	300	2,100	26,900
Other	4,700	38,700	1,200	3,200	47,800
TOTAL	53,800	76,700	3,600	15,300	149,400

Source: A Report to Congress in Water Pollution Control Manpower Development & Training Activities, (March 1972—Page 76)
*Federal EPA and Federal Non-EPA have been combined for the purposes of this report. [p. 13]

EXHIBIT II
MANPOWER PROJECTED IN WATER QUALITY ACTIVITIES—FY 76
SECTORS

Personnel category	Non-governmental	Local	State	Federal	Total
Professional	23,400	5,600	5,500	7,700	42,200
Operator	48,700	38,600	—	5,600	92,900
Technician	38,900	5,200	700	2,500	47,300
Other	15,100	50,400	2,100	4,200	71,800
TOTAL	126,100	99,800	8,300	20,000	254,200

Source: Ibid., p. 77

[p. 14]

EXHIBIT III
MINIMUM ADDITIONAL MANPOWER REQUIRED BY FY 76
SECTOR

Personnel category	Non-governmental	Local	State	Federal	Total
Professional	10,200	1,300	3,400	1,900	16,800
Operator	33,300	8,900	—	1,400	43,600
Technician	18,400	1,200	400	400	20,400
Other	10,400	11,700	800	1,000	23,900
TOTAL	72,300	23,100	4,600	4,700	104,700

Source: Ibid., p. 5.

[p. 15]

EXHIBIT IV
LABOR FORCE GROWTH BY FY 76

Personnel category	1971 Manpower Engaged	1976 Manpower Requirements	% Increase
Professional	25,400	42,200	66%
Operator	49,300	92,900	88%
Technician	26,900	47,300	77%
Other	47,800	71,800	50%
TOTAL	149,400	254,200	70%

Source: Ibid., p. 5.

[p. 16]

EXHIBIT V
FORECASTED TRAINING REQUIREMENTS—AVERAGE ANNUAL LOAD
SECTOR

Personnel category	Non-Governmental		Local		State		Federal		Total	
	Entry	Update	Entry	Update	Entry	Update	Entry	Update	Entry	Update
Professional	2,960	9,140	500	2,480	880	1,920	680	3,900	5,020	17,440
Operator	8,260	16,020	3,480	17,080	—	—	520	2,460	12,260	35,560
Technician	5,160	14,860	480	2,300	100	260	180	1,240	5,920	18,660
Other	2,580	3,280	400	1,260	—	—	240	280	3,220	4,820
TOTAL	18,960	43,300	4,860	23,180	980	2,180	1,620	7,880	26,520	76,480

Source: Ibid., p. 5.

PART III. MANPOWER ANALYSIS

A. PURPOSE AND SCOPE

The purpose of this section is to provide additional information and rationale relative to current and new manpower considerations resulting from Public Law 92–500 and results of education and training efforts by EPA.

B. APPROACH

It is concluded that implementation of the Water Pollution Control Act Amendments of 1972 will require more and better trained people. The legislation provides a large increase in the funds available for the construction of new and upgrading of existing municipal wastewater treatment facilities. New planning approaches will be required for state-wide water quality planning, area systems for waste treatment, and water quality surveillance. Implementation of the National Pollutant Discharge Elimination System adds new regulatory responsibilities to EPA and to state agencies which have programs approved by EPA. This will require new capabilities not only in the public agencies but also in the private organizations who must comply with the new law. Also increased attention will be given to non-point sources of pollution such as erosion, agricultural wastes, mine drainage and runoffs from urban areas. All these new activities will need to be carried out with new and constantly improving technology and institutional arrangements.

[p. 18]

EPA intends to meet its manpower responsibilities primarily in collaboration with the Federal and State educational and labor agencies which have primary responsibility for manpower development.

Additionally, to deal with the manpower factors of the program, the new Federal Water Pollution Control Act continues the authorization for EPA to conduct a broad range of training programs and to establish a system, in cooperation with other public and private organizations, for forecasting manpower. In this regard, the EPA strategy is to have state and local water pollution control agencies define the manpower and training needs of their jurisdictions and meet these needs primarily through their established educational institutions. EPA, in cooperation with the state environmental agencies, will strive to fill training gaps that exist while exploring new training concepts. Also, EPA will develop materials and programs centrally for state and local

application and provide technical assistance to state and local manpower training efforts to assure adequate performance. Further, under Subsection 109(b) of the new legislation, EPA is authorized to provide up to $250,000 per state for the construction of a facility for training of waste treatment operation and maintenance personnel. This effort will take on increasing significance in assisting states to meet their manpower and training needs.

To assist in accomplishment of the manpower program, EPA is endeavoring to have a manpower planning capability established in the water pollution control agency of each major metropolitan area and each state and territory. This manpower planning activity will assist state training personnel in determining the manpower needs in water

[p. 19]

pollution control aetivities of their jurisdictions, and then with counterpart manpower planning councils of the mayor, governor, or planning area the education agency plan programs to meet these needs.

This strategy, in line with the President's decentralization policy, is directed to establishing responsibilities and capabilities at the local level. The EPA role in this regard, in addition to providing assistance in the establishment of the capabilities, involves doing things that can best be done centrally; e.g., develop the manpower planning methods and tools, and training curricula and demonstration training programs, that can be adapted to the needs of individual jurisdictions.

EPA will continue to work with those federal agencies which have primary manpower responsibilities such as the U.S. Department of Labor and U.S. Office of Education, and with them, develop programs to meet mutual objectives. Additionally, EPA also recognizes the contributions that can be made by the members and staffs of the professional and employer associations of the water field—principally, the Water Pollution Control Federation, American Water Works Association, Consulting Engineers Council, and the Water and Wastewater Manufacturers Associations. EPA is continuing to effect communications at all levels which will draw upon the capabilities of their members and meet mutual needs.

C. FEDERAL-STATE-LOCAL MANPOWER PLANNING SYSTEM

EPA continues to carry out a comprehensive program to develop the tools and to implement the system for cooperative

manpower planning described in Section B above and Part II of the 1972 Manpower Report to Congress.

[p. 20]

Occupational definitions and staffing guides have been developed for the management, operations and maintenance functions of wastewater treatment plants in the 0–1 million gallons per day (MGD) range and also the 1–25 MGD and 1–100 ranges. Additionally, occupation and manpower requirement information has been completed for wastewater collection systems in cities and towns from 1,000 to 150,000 in population, and a second manual for cities up through 500,000 in population is nearing completion. Thousands of copies of these manuals have been disseminated to state and local water pollution control agencies, educational institutions and consulting engineering firms, among others.

Projects have been completed relative to the development of manpower planning criteria for state water pollution control agencies. They include demonstration pilot studies in Ohio and Indiana and an initial national effort by EPA. Additional developmental work will be required for the validation of planning criteria relative to state water pollution control functions.

The U.S. Office of Education (HEW), recently funded a project in cooperation with EPA, the American Water Works Association, and the Oklahoma Vocational Education Agency for the development of manpower planning criteria for water supply facilities. Also included in this effort will be materials and information relative to curriculum and training program parameters.

A number of actions have been taken to develop and implement the cooperative manpower planning system. In FY–72 a manual "Manpower Planning for Wastewater Treatment Plants" was published and disseminated. This provides specific guidance on how to obtain, compile and analyze data

[p. 21]

and to forecast manpower and training needs. It also provides guidance on planning, recruiting and training programs and actions to improve employee retention and productivity. Included in this effort is a current project at North Carolina A&T State University relative to personnel management practices in wastewater collection systems. In FY-73, the manual was expanded into a training manual and in FY-74, a similar manual applicable to the total water quality field is to be produced.

In 1972, orientation in the need for and methods of manpower planning was given to 200 representatives of Federal, State and

local water pollution control, education and labor agencies. In 1973, one-week training courses and one-day orientation conferences were attended by 180 representatives of these agencies. As a result of these efforts over 30 state water pollution control agencies have assigned either a part-time or full-time employee to the manpower planning function. Eight additional states are in the process of establishing this capability. EPA has initiated several demonstration grants for the establishment of state manpower planning activities. Also, EPA is presently working with the State of South Carolina to develop and install a computerized municipal facilities and manpower information system.

The U.S. Office of Education is providing technical and financial support for the EPA manpower planning efforts. The Department of Labor is also supporting this effort. A "Cooperative Area Manpower Planning Issuance" explains the objectives of the EPA program to Governor's

[p. 22]

and Mayor's Manpower Planning Councils and solicits their support. Occupation definitions are being developed with support of DOL Field Centers. Also, linkage has been established with the Intergovernmental Personnel Program of the Civil Service Commission.

Last year a nationwide manpower survey of municipal wastewater treatment plants was completed by the DOL-Manpower Administration (MA) and the EPA. Data collected by the MA-affiliated State Employment Security Agencies for more than 90% of the 3,500 plants surveyed in this project, tend to verify most of the conclusions and projections outlined in the 1972 Report to Congress. Although the findings of this survey are now somewhat obsolete at this time in light of numerous new state and local requirements outlined in P.L. 92–500 it still represents a cornerstone in the federal survey effort.

Other surveys completed or currently under development include: A National Survey of Manpower Utilization and Future Needs in Water Pollution Control (complete); Manpower Needs of Equipment Manufacturers conducted by the Water and Wastewater Equipment Manufacturers Association (partial results available for this report); an Initial Study of Private Industrial Manpower Needs (results partially available).

As explained in Part III of the 1972 Manpower Report, EPA is also concerned with manpower recruitment, retention and utilization. Efforts in this area have concentrated on improvement of operator certification practices of state agencies. EPA, with sup-

port of the American Water Works Association and the Water Pollution Control Federation,

[p. 23]

made the following accomplishments in this area: (1) a Model State Law was developed and promulgated by the Council of State Governments; (2) a national certification authority (Association of Boards of Certification (ABC)) to promote improved and consistent certification practices among state agencies has been established; and (3) a body of guidelines for the administration and evaluation of state certification programs was developed and issued; (4) a classification system for water and wastewater personnel and facilities is currently under development by ABC under a grant by EPA.

To provide a basis for promoting productivity improvement in wastewater facilities, a study was completed in FY-73 on the application of industrial engineering techniques to facility design and operation.

In FY-74 a project will be undertaken to identify and develop solutions for problems encountered by small communities in recruiting and retaining qualified workers for their wastewater facilities. This will also address the need to ensure fair employment opportunities in this expanding area of employment.

D. MANPOWER OVERVIEW

The manpower available for implementing the new legislation can be readily characterized under the general occupational categories of (1) professional (which includes engineers and scientists), (2) operators, (3) technicians, and (4) others which includes maintenance

[p. 24]

personnel and related blue collar and general administrative types. New entry employment opportunities in water pollution control are expected to exceed the 1972 estimates over the next several years. The original estimates were 5,000 per year for professionals, 8,700 per year for operators, 4,000 per year for technicians, and 4,700 for other occupations.[1] An increase in sources of supply, on the other hand, does not seem likely to occur.

Professionals—The current annual supply of qualified personnel from external sources will not adequately cover the total manpower demand. Professional hiring will come from related fields in all sectors (government and non-government) and grad-

[1] Ibid., p. 5.

uate training programs of universities will supply approximately 2,000 [2] specialized graduates per year under a multitude of engineering and scientific disciplines for the water pollution control field. Undergraduate programs will provide a very nominal number (perhaps as few as a few hundred) of "specialized" graduates for water pollution control, who can take on professional level assignments initially. Of course, various types of non-environmental degrees will fill positions which are available in order to help take up some of the slack that exists. Additionally, vocational education schools with two-year programs provide for a limited number of personnel entering the professional ranks who are fully qualified. These non-specialized personnel acquire the necessary additional skill and knowledge requirements through additional training (formal or informal) provided by their employer and others.

Care must be shown in placing these individuals to ascertain that

[p. 25]

their performance ability is of high enough caliber to meet operating criteria. It is worth noting that the conferees on Environmental Education at Drexel University (August 1973) gave tentative approval to less than professional level education, recognizing the need for added trained personnel. Where professionally trained personnel are not available, pollution control activities are making use of lesser trained individuals, with an apparent resulting loss of efficiency in pollution abatement and control.

Operators, Technicians and Maintenance Personnel—EPA-sponsored programs are currently providing training for between 1,000–2,000 [3] new entry personnel and 5,000–7,000 [4] upgrade and update category personnel annually for the operation and maintenance of wastewater treatment plants, mostly at the local level. Similarly, upgrade and update training for technicians numbers at about 800–1,200 [5] annually. The actual new entry need for operators, technicians and maintenance personnel still far exceeds this entry training provision. Most new entry personnel are drawn from the general labor market. They have little or no previous experience in related activities, yet do possess some demonstrated ability. Others from the labor market have related

[p. 26]

skills or are untrained people who receive hands-on experience

[2] EPA Office of Water Programs Academic Training Analysis Report (1973).
[3,4,5] EPA Office of Water Programs, Manpower Development Staff Summary Analysis: 1971–73.

through on-the-job training; numerous positions though remain vacant and are not filled.

E. SUPPLY AND DEMAND

The water pollution control manpower universe can be divided into sectors for the purposes of analyzing their manpower and training situations. These sectors are: (1) non-governmental; (2) local government; (3) state government; and (4) federal government.

1. *Non-governmental*

a. Industrial—Industrial firms can be expected to represent one of the largest consumers of the current available manpower—an increase of over 100,000 [6] over the next 3–5 years. The increase can be directly attributed to the water pollution control legislative provisions outlined

[p. 27]

under Part I.C. of this report. The demand will cut across all occupational categories (professional engineers and scientists, treatment plant operators, laboratory technicians and maintenance personnel), but plant operators and technicians represent the greatest demand. Professional staffs will be involved with more complex treatment plant process selection, plant design, supervision, analysis of industrial effluents and coordination with municipal utilities to negotiate pretreatment processes and municipal treatment charges for wastewater discharged into the municipal sewer system. Operators will assume increased responsibility for the operation and maintenance of the increasing number of types of treatment facilities, while laboratory personnel will be employed to analyze the effluent and monitor its quality through various processes to the discharge point. As previously pointed out, industrial concerns discharging wastes into a receiving waterway, will be issued "permits" either by EPA or the state all in conformance with effluent limitations guidelines. Industrial organizations will be responsible to see that these effluent limitations are maintained.

The most significant difference from the projections made in the 1972 Report to Congress is that there is a much greater number of people presently employed by industry in water pollution control activities.[7]

[6] Study by Dr. J. Middlebrooks, Utah State University—Sept. 1973.
[7,8] Ibid.

However, careful examination of the data obtained in an EPA survey of 10,000 industries [8] indicates that although the total number of employees engaged in water pollution control may have been underestimated, the number of full-time-equivalent employees may not be in error to any

[p. 28]

significant degree. The majority of the companies reporting the percent of effort for the various personnel indicated an average of less than one-eighth of their time was devoted to water pollution control. When the totals are reduced to full-time equivalents and the number of industries that were not included in the 1972 Report are considered, the results indicate reasonable agreement between the two estimates.

The 1973–76 period will witness a continuation of the current trend of using personnel actively engaged in some other production process of the industry to supervise the personnel conducting industrial wastewater treatment operations. Therefore, the increase in professional personnel will be largely in process functions, and people now devoting a small portion of their time to handling water quality responsibilities will allocate more time to wastewater concerns. While the professionals hired into the industrial wastewater treatment positions will require training specifically focused on water concerns, because their responsibilities in training have been process-oriented, little increased burden from this sector is expected on those educational institutions that now educate environmental engineers. Rather it is reasonable to expect that educational institutions will utilize an increasing portion of their resources to deliver specialized short courses to accommodate the needs of new industrial entrants and others in need of similar training.

In light of these considerations, it appears that industrial employers of water quality personnel will experience sizable increased need for trained personnel in the 1973–76 period and that the nature of training delivered will increase in technological sophistication at all levels. Estimates of the average annual industrial water quality training load needed to maintain progress in the efforts to control water pollution are

[p. 29]

expected to remain basically as projected in the 1972 Report to Congress.

b. *Educational Institutions*—Manpower employed by educational institutions consists almost entirely of engineers, scien-

tists, and technicians who perform activities in teaching, research, curriculum planning, and advisory consulting to government agencies and consulting engineering firms. The ratio of technicians to professionals in this subsector is approximately two to one, and the total number of technicians employed in these institutions is under 1,000.[9] Most technicians hold bachelor's degrees and are responsible to collect data and conduct laboratory experiments in research areas, and few technicians teach. A number of graduate students also serve as teaching fellows and research fellows, but they are not included in the educational water quality manpower inventory because they are still active students. The current inventory of professionals in this area is estimated to be approximately 700.[10]

It is estimated that educational institutions are now operating at two-thirds of their capacity to produce trained professionals and that they would be able to produce 50 percent more if the job openings existed to create the educational demand. However, utilization of this capacity would necessitate a major diversion of current staff from research to teaching—which is, of course, unrealistic. The true expansion factor for the production of trained professionals using only the existing teaching force is therefore something less than a 50 percent increase.

[p. 30]

For this reason, educational institution manpower in water quality is expected to experience little change between 1972 and 1976.

Training needs for personnel employed by educational institutions are not enumerated, but this should not be interpreted to mean that they do not require additional training. If an instructor is to remain current in his specialty area and possess enough general knowledge to produce well rounded professionals and technicians for practice, it is essential that he devote at least one of every 5 to 6 years of his career to additional study at another institution or research laboratory.

c. *Manufacturers of Wastewater Analysis and Treatment Equipment and Chemicals*—The wastewater equipment and chemical suppliers represent the most diverse groups that employ professional and technical water pollution control personnel. Services provided by this group range from turn-key type operations, which provide everything required from a completed treatment faciilty to the sale of chemicals. The professionals performing the various functions possess all types of academic backgrounds,

[9,10] Ibid.

and it would be essentially impossible to use a general classification scheme for the entire industry.

As part of the overall evaluation of manpower needs in the environmental field, a survey of water and wastewater equipment manufacturers and suppliers is being conducted jointly by the Water and Wastewater Equipment Manufacturers Association (WWEMA) and the EPA. A questionnaire has been mailed to approximately 280 members of the WWEMA.

In certain employee categories, significant increases are anticipated, while figures in other categories indicate little change over those reported in our 1972 Report to Congress. In general, however, it appears that a significant increase in

[p. 31]

manpower requirements will occur in the employee categories traditionally employed by equipment and supply firms.[11]

The anticipated training needs for equipment manufacturing personnel in the professional and technician categories are somewhat higher than originally estimated. Approximately 10 percent are expected to require long term advanced training over the next several years. The majority of this training will be received in residence at universities. A larger percentage are expected to require short term training, portions of which will be provided by universities in extension courses and workshops. Probably a majority of the short term training required in the equipment area will be conducted by the industries own training staff.

d. *Consulting Engineers in Design and Operations*—Consulting engineering organizations represent one of the major types of employers of water pollution control specialists. Water quality personnel employed by such firms engage in such activities as water resources planning, preliminary engineering studies, feasibility and economic studies, process selection and evaluation, preparation of plans and specifications, construction administration, resident engineering supervision, plant start-up and consultation, and monitoring of systems. In the smaller engineering firms, a staff of two or three professionals are involved in all of these activities, while larger firms will be more specialized, with professionals who are involved in only segments of a project and a senior engineer assigned the task of coordinating the various phases.

[p. 32]

[11] Ibid.

A substantial growth rate is anticipated for all categories of technical and professional employees in the consulting industry. All categories are expected to double [12] in numbers of 1976 if the anticipated growth occurs, and there is little doubt that expenditures will necessarily increase significantly in order to meet water quality standards.

Even without an increase in industrial expenditures, all professional categories will experience approximately a 70 percent increase in manpower utilization by the consulting industry. The current manpower inventory of consulting engineering firms has been calculated from a study recently completed for EPA. The following pertinent information applies:

(1) There are approximately 1,200 [13] consulting engineering firms engaged in water pollution control with four employees or more;

(2) Professionals employed in the consulting engineering field will increase from a total of approximately 13,500 to over 28,000 by the end of 1976 [14] which is a sizable increase over 1972 estimates. (Based on annual expenditure of approximately 3 billion per year for the next 3 years);

(3) Technicians employed by consulting engineering firms are expected to increase from approximately 11,000 to over 22,000 [15] by the end of FY 1976 which is also a significant increase from our original estimates.

(4) The requirements for chemical and other types of engineers and professionals can in all probability be met from the existing and forecasted manpower pool. However, the need for sanitary engineers and environmental engineers can only be met by drawing from the very limited source of supply.

[p. 33]

(5) On a national basis, it is projected that approximately 4,500 [16] professionals and 2,500 [17] technicians employed in the consulting engineering industry should attend short-term training—3 days or less—over the next three years to remain current and 3,300 [18] professional and 1,500 [19] technicians should be enrolled in long-term programs of a week or more. Failure of the private sector to implement training may have an adverse affect on personnel competence and manpower supply.

The above results indicate that a significant number of short-term programs will be needed to satisfy the need for refresher

[12, 13, 14, 15] Ibid.
[16, 17, 18, 19] Ibid.

courses. The existing academic programs are probably adequate to provide the long-term program, but a more concerted effort on a regional or state level will probably be required to satisfy the need for short-term programs. The consulting industry represents only a small percentage of the total number of people employed in the water pollution control field, and based on the need for additional training in the consulting industry, it seems reasonable to assume that the total need for additional training will far exceed the totals projected for consulting. It is estimated that the training needs of consulting firms represents less than 5 percent of the total that have similar needs and are employed in the water pollution control field. Based on the results of this study it would seem that a significant demand exists for well-organized, short term, continuing education courses.

[p. 34]

2. *Local Government Sector*

A vast majority of the approximately 13,000 [20] communities in this country have wastewater collection systems either with or without wastewater treatment plants and the latest data indicates that there are nearly 21,000 [21] municipal wastewater treatment plants in operation with another 4,000+ [22] on the drawing boards, and another 370 [23] currently being built. Plants range in size from the very small employing a few people, to the very large employing hundreds. Current EPA inventory information shows the following breakdown of plants:

(Million Gallons Per Day)	MGD	NUMBER
	0–1	18,050
	1–5	2,170
	5–10	355
	10–25	225
	25+	150
	Total	20,950 [24]

Local government will share significant responsibilities in assuring water quality in treatment plant operation and as partners with the State Government in implementing their portion of the water quality plan with adjoining communities. Manpower estimates from the 1972 Report to Congress remain valid although quite conservative (a recent analysis of wastewater

[20] A Report to Congress in Water Pollution Control Manpower Development and Training Activities, March 1972, p. 57.

[21,22,23,24] EPA Storet Data Inventory File, Sept. 1973.

collection systems, for example, shows an original underestimation of current employment and needs by a factor of 2).[25]

[p. 35]

As indicated in the 1972 Report, local employment will reach in excess of 100,000[26] by the end of 1976 from a base of approximately 80,000[27] today (perhaps 30% more predicated on the new legislation). Wastewater treatment operation and maintenance personnel remain the most critical occupation and there will be increased demand placed on this occupation category from private industry and other sectors.

Update and entry level training requirements remain as previously estimated for the 1972 report, which is considered conservative: that is a total annual training need for 4,900[28] new entry level personnel and for updating 23,200[29] plant operation personnel represent 75% of this training load. As previously stated, EPA assistance in training activities only partially fills the current demand. There are other sources of training assistance including the local governments. Assistance for training from local governments is likely to grow. Local governments should have increased revenues for operations and maintenance pursuant to EPA requirements that users be charged for sewage treatment services.

3. *The State Sector*

The manpower requirements of state agencies, in order to properly implement, monitor and control the various water pollution control programs, required by the new Federal legislation basically parallel the needs portrayed in our 1972 Report to Congress since the state role in implementing new water pollution control legislation was anticipated. Strong management will be required to properly implement their programs. Additional expertise is required from external sources, particularly in the professional area. Orientations and specialized training programs throughout the states are required to assure program success.

[p. 36]

Planning demands imposed by the new legislation require experienced individuals. Planners have not previously been employed to any significant extent in many of the state water pollution control agencies. Planners may be found to an extent in

[25] Manpower Requirements for Wastewater Collection Systems, N.C.A.&T. State University, July, 1973.

[26,27] A Report to Congress in Water Pollution Control Manpower Development and Training Activities, March 1972, p. 58.

[28,29] Ibid, p. 61.

other state agencies, particularly state planning departments. Other major functions being expanded include: surveillance and monitoring, inspection, certification; training and programs relative to pollution resulting from feed lots, mine drainage, oil field brine, etc. Major changes in planning for water pollution control facilities are associated with metropolitan/basin plans and with the administration of a "permit" program. Changes in other programs involve mainly the certification of operators, the training of operators in operation and maintenance methods and technician requirements for water analysis surveillance and monitoring. A review of the FY 74 submission of state program plans to EPA from all states indicates a planned manpower level in excess of 5,000; [30] up from 3,600 [31] this year (anticipated growth to over 8,000 [32] by the end of FY 76). The expected FY 74 state increases are most significant in the functions of, "Permit Application and Compliance" and "Planning and Water Quality Standards." A coordinated effort to train state agency personnel is needed.

Current training needs for entry professional and technician personnel are estimated at conservatively 1,000 [33] per year and update training for over 2,100 [34] annually which is consistent with the 1972 Report. However, new water analysis reporting requirements under the National Pollution Discharge Elimination System indicates, as a result of determinations made in a four-state study in EPA Region VII, indicates a need for Water Analysis Testing Techniques and Procedures training for 2,000 [35] operators,

[p. 37]

technicians, and supervisory personnel that as many as 25,000 need to be trained on a national basis. This was not projected in the 1972 estimated training needs in our previous report to Congress.

4. *Federal Government Sector*

The Environmental Protection Agency is the lead agency in the Federal Government's program for water pollution research, abatement, and control. The Office of Air and Water Programs of EPA is primarily responsible for ensuring a coordinated and effective federal effort to protect and enhance the quality of the nation's water resources. The manpower resource of EPA pertaining to water pollution control has grown to approximately

[30,31] EPA OWPO MDS Summary Analysis, Sept. 1973.
[32] Report to Congress, op. cit., p. 64.
[33,34] Ibid, p. 65.
[35] EPA Region VII Manpower Analysis, 6/73.

3,000.[36] Relative to training, over the next several years update training of agency employees should be at a rate of approximately 1,000 [37] per year/and 400 [38] per year for personnel entering the agency. Both update and entry level training is necessitated by the rapid growth and changes in the EPA Water Quality Program and the improvements in technology. Training needs will be partially satisfied through the Agency's Direct Technical Training programs.

Other federal agencies are required to strengthen their water pollution abatement and control efforts in that all federal activities are required to adhere to the same water quality standards and effluent limitations imposed on private industry, the states and municipalities.

Data from the 1972 Report to Congress remains usable. There are over 12,500 [39] professional, technical, operator and maintenance personnel

[p. 38]

involved in water pollution activities in non-EPA federal organizations. The imposition of more stringent requirements will necessitate an increase to at least 15,800 [40] over the next few years in order to keep their activities up with the latest water quality requirements. Further study on the total impact of the new legislation is needed in this sector. Training required will be in all occupational categories (operator training being the greatest) to ensure that personnel are aware of the most current technological advances, that they adhere to the latest requirements, and that they observe proper operations and maintenance procedures relative to wastewater treatment and collection. There are approximately 9,000 [41] waste treatment plants in the federal system. However, a vast majority, well over 50%, are plants of very small size requiring only one part-time operator. Nonetheless, operator training needs conservatively should be required to average over 500 [42] for entry level per year and update training of 2,500 [43] annually. All other occupational categories should require entry level training for 700 [44] per year and over 3,500 [45] update training.

In sum, total water pollution abatement and control manpower training requirements are projected to rise over the estimated requirements cited in the 1972 Report to the Congress as a result

[36] Report to Congress, op. cit., p. 73.
[37,38] Ibid, p. 74.
[39] Ibid, p. 75.
[40] Ibid, p. 68.
[41] Ibid, p. 203.
[42,43,44,45] Ibid, p. 70.

of the implementation of the Federal Water Pollution Control Act Amendments of 1972. Increases will be experienced in all job categories with the greatest numbers of trained personnel needed in wastewater treatment and related functions. As examples, industrial operations will be governed by a

[p. 39]

"permit" to assure water quality and in most instances will require pretreatment of industrial wastes prior to release into municipal collection systems; manufacturers of wastewater equipment and chemicals, supported by consulting engineers, will expand their businesses as a result of the significant Federal expenditures for the construction of wastewater collection systems and treatment facilities; Government environmental and related agencies at the federal, state and local levels will significantly expand their manpower resource efforts to develop programs and action plans in order to implement the numerous water quality legislative requirements.

[p. 40]

IV. TRAINING PROGRAMS

A. GENERAL

The EPA strategy for developing effective and comprehensive approaches to training relates to the essential ingredients of any manpower training program; requisite educational capacity, information, and financial support. Once a need has been identified, capacities must be identified or developed and supported in order to respond to that need. It is EPA's policy to work within the existing institutional framework and develop and encourage the use of new mechanisms for the delivery of training at the point closest to the source of the need. EPA strategy is to help build this capacity and to supplement rather than supplant the activities of others.

In implementing this strategy and in supplementing the roles of others, EPA has focused its programs to: (1) support universities and individual students mainly at the graduate levels in programs leading to professional careers in water pollution control; (2) provide a continuous training mechanism for updating these and other personnel, to provide them with the results of technological advancements in the field; (3) expand the coverage of programs of other federal agencies to channel their resources more effectively to the manpower and training needs in water pollution control; (4) strengthen the capacities and ca-

pabilities of the states and two-year educational institutions to help provide an adequately

[p. 41]

trained core of treatment plant operators and water pollution control technicians.

In shaping its training programs, EPA's Office of Water Program Operations is attempting to help satisfy the unmet needs of the professionals and the operators and technicians who constitute the existing or potential manpower who are required to control water pollution. The EPA's activities in water pollution control training are described in this section of the supplemental report.

B. PROFESSIONAL TRAINING GRANTS FOR GRADUATE PROGRAMS

Pursuant to Subsection 104(g)(3)(A)) of the Act, (formerly 5(g)(3)(A)), EPA awards professional training grants to institutions for the establishment, expansion and improvement of graduate level programs in water pollution control. This program is intended to produce a cadre of professionals trained to contribute to water quality management through subsequent positions in research, consulting or direct operations in the public or private sectors. Renewable grants are awarded for one year at a time as part of a training project of five years duration. Grant funds primarily are used for student stipends as well as when needed to expand and improve staff facilities and equipment and for the development of curriculum.

Under these grants training has been provided in the following disciplines:

1. Environmental Engineering
2. Sanitary and Public Health Engineering

[p. 42]

3. Environmental Chemical Engineering
4. Environmental Systems Engineering
5. Agricultural and Environmental Engineering
6. Environmental Mining Engineering
7. Soils Environmental Engineering
8. Environmental Biology
9. Limnology and Aquatic Biology
10. Estuarine, Biological, Physical and Chemical Oceanology

11. Physical Sciences
12. Interdisciplinary Environmental Programs
13. Social and Political Science Programs
14. Course and Project Development

Into the professional category fall those jobs that require creative problem solving ability; the professional is expected to deal with analysis and correction of unusual management or technical problems. Environmental and Sanitary Engineers are predominant professionals in the field. In addition to their engineering training they are schooled in life and physical sciences and are commonly employed as planners, designers, administrators or facility managers. The professional category also includes civil, electrical and mechanical engineers and architects who design and construct facilities, chemical engineers who design and modify operations and treatment processes, mechanical and electrical engineers who design and operate the electrical and materials

[p. 43]

handling systems in the larger wastewater treatment facilities and the sewage collection systems. As a result of experience and continuing education, these engineers frequently become specialists in water pollution control activities.

In addition to engineers the professional category includes scientists who are involved in research, monitoring and technical supervision. Chemists and microbiologists engage in water analysis in treatment facilities and other water sources while aquatic biologists analyze the effects of pollution on water life. These scientists assist in the design and analysis of waste treatment processes and water quality measurement systems.

Over the years these programs largely have been responsible for the reservoir of scientific and engineering manpower now available in the water pollution control field. Indeed, most of the graduate level programs related to water pollution control have been supported by EPA at one time or another. This support has been specifically oriented to water pollution control as opposed to the more general orientation of support from other federal agencies.

Recent and projected professional training grants program activities are summarized as follows:

[p. 44]

EXHIBIT VI
RECENT AND PLANNED PROFESSIONAL TRAINING GRANTS PROGRAM ACTIVITIES

	ACADEMIC YEAR				
	1970–71	1971–72	1972–73	1973–74	1974–75
Number of Trainees Authorized	788	932	1241	845	640
Number of Professional Training Grants	88	91	102	74	52
Number of States Involved	43	43	43	40	33
Number of Institutions Involved	72	82	92	69	48
Funds Awarded	$3,781,756	$4,562,682	$4,701,679	$3,181,890	$2,950,000

C. RESEARCH FELLOWSHIPS

Pursuant to Subsection 104(g)(3)(B) of the Act, (formerly 5(g)(3)(B)), EPA has awarded fellowships to students for selected specialized training in water pollution control. The purpose of this program is to increase the number and competence of engineers and scientists qualified to conduct independent study and advanced practice at the graduate level. Awards are made on a competitive basis primarily to doctoral candidates in engineering, physical sciences, and biological sciences of socioeconomic disciplines. Applicants for this program have been reviewed with the objective of selecting only the most promising students. The Research Fellowship Program has been viewed as the primary source of instructors for university training of professionals and the primary mechanism for building the capacity of research and training for professionals.

Recent evaluation of the production from the Research Fellowship Program has led EPA to phase out this program and initiate a program designed to augment and improve the caliber of professional personnel working for state and local water pollution control agencies. It has become apparent during the past few years that the supply of professionals in teaching, research, and in specialty levels is approaching saturation and that the need for federal support for research fellowships at this level should be eliminated. Concomitantly, the need for better qualified and more

[p. 46]

highly skilled professionals at the state and local agency level, has become more critical. Fellows will be selected from prospective or actual employees of state and local agencies as a

means of improving those agencies' role in environmental protection. Therefore, under the same authorization as the Research Fellowship Program a new Fellowship Program, having a great impact on meeting Federal clean water goals is being initiated.

Recent activities under the Research Fellowship Program are as follows:

[p. 47]

EXHIBIT VII
RECENT RESEARCH FELLOWSHIP PROGRAM ACTIVITIES

	ACADEMIC YEAR				
	1970–71	1971–72	1972–73	1973–74	1974–75
New Research Fellowships Authorized	60	46	31	0	0
Total Research Fellowships Awarded	105	108	70	21	0
Number of Active Fellows	149	161	103	21	0
Number of States Involved	29	27	27	12	0
Number of Institutions Involved	51	58	29	12	0
Funds Awarded	$600,000	$600,000	$461,003	$135,900	0

D. TECHNICAL TRAINING GRANTS AND SCHOLARSHIPS FOR UNDERGRADUATE STUDY

Section 109 (formerly Section 16) authorizes the award of grants to or contracts with institutions of higher education—to assist them in planning and developing, strengthening, improving or carrying out programs or projects for the preparation of undergraduates to enter an occupation which involves the design, operation and maintenance of treatment works and other facilities whose purpose is water quality control.

The objectives of this section are: (1) to plan, develop or expand training programs at this level; (2) to train and retrain faculty; (3) to support innovative and experimental programs of cooperative education; (4) to develop and research materials to plan curriculum.

Section 111 (formerly Section 18) authorizes the award of "Scholarships for Undergraduate Study by Persons Who Plan to Enter an Occupation Involving the Operation and Maintenance of Treatment Works".

Three areas of training have been addressed under Section 111: (1) training of qualified high school students at two-year

institutions in the operation and maintenance of waste treatment and related facilities; (2) improvement of the training of junior and senior bachelor's degree engineering students in the design of waste treatment facilities at four-year colleges; (3) short-term institutes for training of undergraduate faculty in water pollution control.

[p. 49]

Three institutions (Charles County Community College, Linn-Benton Community College, and the Greenville Technical Education Center) have completed development of program curricula based on the guidelines prepared by Clemson University and have opened their degree programs in wastewater technology training. Curricula will vary among the institutions but will essentially cover wastewater treatment operations including classroom theory and hands-on training in a nearby cooperating wastewater treatment plant as well as basic training in algebra, general biology, microbiology, hydrology and practical physics. About 20 students will attend each program. Graduates receive associate of science degrees and will be eligible under voluntary or mandatory state certification programs to apply for superintendent positions of medium-size wastewater treatment plants.

During the past five years the number of undergraduate courses dealing with the environment has increased significantly. This increase in course offerings has not been matched by a corresponding increase in qualified staff to teach these new courses. Therefore, in FY 1974 two short-term institutes will be held to retrain undergraduate faculty in water pollution control techniques. They will be given at Tufts University and Utah State University in June 1974. This training is intended to fill the gap between entry level operator training and the three to five-year professional training.

[p. 50]

As the shortage of manpower for water pollution control becomes more acute the importance of senior level entry training in four-year design engineering will increase. This can be attributed to the entrance requirements to assume responsibility previously reserved for the "professional" level.

With construction grants presently funded at the multi-billion dollar level annually and with the growing manpower requirements to service these facilities as established by all manpower projection studies, it appears that this will be an important area.

E. DIRECT TECHNICAL TRAINING PROGRAM

Under Subsection 104(g)(3)(C), (formerly 5(a)(5) and 5(g)(3)(C)), of the Act, EPA is authorized to provide training in technical matters relating to the causes, prevention, reduction and elimination of water pollution to personnel of public agencies and other persons with suitable qualifications. Under this authority EPA provides its own program of direct training and related supportive activities to supplement the technical activities of others.

The EPA Direct Technical Training Program is directed to key federal, state, local and private personnel who hold responsibility for evaluation, prevention, abatement and control of water pollution. Its purpose is four-fold.

1. To provide a continuing comprehensive program of specialized and technical training generally unavailable elsewhere.
2. To research and develop instructional technology and to provide an instructional program for individuals who are responsible for and/or conduct environmental training or related activities.

[p. 51]

3. To provide, on request, instructors and/or training materials in support of training programs of other federal, state and local agencies.
4. To develop new training delivery methods, curricula and materials, such as those for use in correspondence courses.

Most direct training consists of short-term seminars, workshops and courses of one to two weeks duration. These courses, at the National Training Facility in Cincinnati, Ohio and in EPA Regional facilities, are conducted by a highly trained and experienced EPA professional staff.

During FY–74 a number of short courses will be expanded and courses will be offered in regions that lack a permanent training facility. Federal personnel who will be working with programs related to state and local agency activities will form the single largest group of participants. State and local personnel will form the next largest group.

EPA estimates and actual classroom students over prior and forecasted fiscal years are/will be as follows:

Number of Students
Fiscal Years

1972	1973	1974	1975	1976
2,200(a)	2,800(a)	2,850(e)	2,900(e)	3,000(e)

(a) = Actual (e) = Estimated

EPA also supports state training programs for professionals, technical and operator personnel on request through technical

[p. 52]

consultation on the planning and development and dissemination of training courses. In addition, the Agency arranges for guest appearances of instructors and provides instructional material such as training manuals, course plans and audio-visual training aids. In FY–73 audio-visual training aids were loaned out for 843 training efforts which were used as instructional material for over 10,000 trainees.

Training provided through scheduled and unscheduled (special) workshops, seminars and short-term courses has increased in volume during the last five years. This increase has been accomplished within restricted funding and an actual reduction in instructor man-hours. The increase in the number of courses presented and the number of students attending since 1969 is as follows:

Year	*Courses*	*Students*
1969	45	1,297
1970	57	1,560
1971	59	1,630
1972	89	2,200
1973	73	2,800

In addition, there has been a steady increase of requests by local, state and federal agencies for professional assistance and instructional materials to satisfy their special training needs. This assistance is making it possible for the states to increase their own training capabilities.

[p. 53]

F. EPA TRAINING FOR OPERATORS AND TECHNICIANS

1. *Externally Funded*

EPA has collaborated with the Department of Labor (DOL), the Department of Health, Education and Welfare (HEW) and the Department of Defense (DOD) in administering and operating five Interagency Programs funded under the Manpower Development & Training Act of 1962 and the Social Security Act, to provide entry level and upgrade training for operators and technicians. These programs are designed to bring persons into the water quality field and to develop and increase the skills of those already employed. They include: (a) MDTA On-the-Job (OJT) Training; (b) MDTA Institutional Training; (c) Pub-

lic Service Careers Plan B; (d) MDTA Military Transition Training, and (e) Work Incentive (WIN–II) Program.

All five are supported by funds provided by the Department of Labor through Interagency Agreements. Subagreements are awarded by EPA to units of state government, municipalities, special wastewater treatment districts, vocational schools, community colleges and universities.

a. *On-the-Job-Training*

This program offers entry-level and upgrade operator training in water and wastewater treatment plants through combined classroom and on-the-job training tailored to meet operational realities.

Under the decentralized approach, classroom instruction is given in one plant during working hours depending on the class-plant environment. Supervised OJT is provided by the class instructor (who must have operational knowledge) in the plant [p. 54]

where the trainee is employed. To eliminate gaps in coverage, two correspondence courses and audio tapes are available for self-study at home.

The national program seeks to assist states in developing training capabilities. Initially, the program focused on improving the skills of operators already in place and in turn, upgrading plant operators. Its objectives were to help trainees meet certification requirements and to reduce turnover and stabilize the existing work force. The first Interagency Agreement required that 10% of all trainees be new entry and that the remainder be employed in the treatment plant prior to attending the program. The second Interagency Agreement increased the number of new entries to 30%. The third and fourth years required that 40% of all trainees be new entrants.

The length of the first training course was 44 weeks and consisted of 330 hours of classroom instruction and at least 70 hours of supervised OJT for each trainee. The first 100 hours of classroom instruction were normally devoted to basic courses and varied subjects such as mathematics, biology and chemistry, which would help the trainee during the following 230 hours of job related courses and 70 hours of supervised OJT. This was modified in later Interagency Agreements to meet the needs of the trainees.

Based on the success of the initial program which cost $1,031,775; the second National MDTA–OJT Interagency Agree-

ment was awarded to train 1,000 persons at a cost of $1,260,000. A total

[p. 55]

of 1,260 trainees were enrolled into the second program and 1,123 completed the training. The program under this Interagency Agreement represented refinement of the initial training course. The third agreement was awarded to train 870 persons at a cost of $999,978. A total of 1,548 trainees were enrolled and 1,413 completed the training.

The Fourth National MDTA–OJT Interagency Agreement is designed to train 1,000 water and wastewater operator trainees as part of a larger program which includes training for air pollution control, solid waste management and pesticides control. Funding support for the water and wastewater portion is $850,000. Projects will be conducted for 16 to 26 weeks depending upon a trainee's occupational level (16 weeks for upgrade—20 weeks for new entries and 26 weeks for disabled veterans and/or disadvantaged persons). Forty percent of those trained will be new entries.

Most graduates of the National MDTA–OJT program have received promotions, earned higher salaries, and passed certification examinations. A major strength of the program has been its mobility in searching out the small wastewater treatment plant through decentralized OJT and its introduction of the classroom instruction into the treatment plant. This program is now operated by the 10 Regional Offices of EPA with funding and program guidance coming from Headquarters. During FY-73 this regionalization resulted in 34% more completed trainees for 20% fewer dollars.

The following table is a resume of the third National OJT Agreement:

[p. 56]

EXHIBIT VIII

Resume of the Third National	*OJT Contract*
Effective Date	March 1, 1972
Termination Date	July 31, 1973
Total Amount of Contract	$999,978.00
Total Number of Trainees Under Contract	1,270
Total Number of Trainees Starting Program	1,543
Total Number of Trainees Completing Program	In Progress

Sponsor/Subcontractor	Trainees Entered	Trainees Completed
California State Water Resources Control Board, Sacramento, CA	108	101
California State Dept. of Public Health, Berkeley, CA	56	52
Connecticut Environmental Protection Agency, Hartford, CN	62	58
Delaware Dept. of Natural Resources, Dover, DE	23	20
Florida State Dept. of Pollution Control, Tallahassee, FL	30	30
Georgia Dept. of Natural Resources—EPD, Atlanta, GA	22	21

EXHIBIT VIII CONTINUED

Sponsor/Subcontractor	Trainees Entered	Trainees Completed
Illinois State Environmental Protection Agency, Springfield, IL	23	21
Indiana State Board of Health, Indianapolis, IN	185	166
Kansas State Dept. of Voc. Education, Topeka, KS	22	20
Louisiana State Dept. of Public Health, New Orleans, LA	17	16
Maryland Environmental Services, Annapolis, MD	30	30
City of Neosho, MO, Neosho, MO	22	20
Dept. of Environmental Control, Lincoln, NB	41	41
Dept. of Public Health, Las Vegas, NV	26	20
New Mexico Environmental Improvement Agency, Santa Fe, NM	40	35
North Carolina State Dept. of Natural Resources, Raleigh, NC	21	18
Oklahoma City-County Health Dept., Oklahoma City, OK	61	59
The City of Portland, OR, Portland, OR	42	37
Public Service Institute, Harrisburg, PA	33	33
Environmental Quality Board, San Juan, PR	50	50
South Carolina State Pollution Control Authority, Columbia, SC	28	27
South Dakota State Dept. of Health, Pierre, SD	17	17
Tennessee State Dept. of Public Health, Nashville, TN	26	26
Utah State Division of Health, Salt Lake City, UT	26	22
Vermont Agency of Environmental Conservation, Montpelier, VT	46	44
Virginia State Water Control Board, Richmond, VA	17	10
West Virginia State Dept. of Health, Charleston, WV	43	40
		[p. 57]
Texas Water Quality Board, Austin, TX	45	35
Dept. of Health, Div. of Environmental Health, St. Thomas, VI	10	10
City and County of Honolulu, Honolulu, HI	26	21
Metro Sanitary District of Greater Chicago, Chicago, IL	22	19
Idaho State University, Pocatello, ID	59	54
North Central Texas C.O.G., Arlington, TX	92	89
Detroit Metro Water Dept., Detroit, MI	167	141
Binghamton-Johnson City, Binghamton, NY	10	10
Totals	1,548	1,413

[p. 58]

b. *Institutional Training*

The EPA administers the institutional training program in the area of water and wastewater treatment plant operations, for the unemployed and underemployed or those persons with no marketable skill. The first Interagency Agreement was negotiated in FY-1971 for 360 trainees at a training cost of $739,690. Nine pilot regional manpower training centers were established.

A distinctive feature of this 22-week program is coordination of half classroom instruction with half of the course in practical hands-on training at nearby municipal wastewater treatment facilities. Most classes enrolled 20 students with an operator instructor and related subject instructors. At first the recruiting and placement were conducted primarily by local employment services. Actually 458 trainees enrolled and 323 completed the course, 19 of which continued their education in the field with 289 entering the labor force leaving 15 who could not be located.

Under the national emphasis to assist veterans, inquiries from veterans requesting training resulted in EPA serving as registrar

for the courses and referring the applicants to the proper employment services for testing and final screening. The major portion of job placement assistance was stepped up by EPA staff participation. With continuous evaluation, better education programs for students and more maturity of veteran separatees and retirees, the program became more effective under a second interagency agreement in FY-1972 with DOL and HEW for training 260 students at a cost of $551,234.

[p. 59]

Included in this agreement was a provision to permit upgrade training of 82 operators.

By the middle of August 1973, a total of 299 had been enrolled for entry level training with 178 in jobs, 14 continuing education and 38 in training. Ten more trainees with committed job openings had yet to be enrolled. The upgrade segment had 68 enrolled out of the anticipated 82 operators. In Mississippi where 50 of these have been hired for training the majority are from the disadvantaged ranks.

Under this agreement, institutional training is scheduled for completion and termination in early 1974. A summary of the program's activities to date is included below:

[p. 60]

EXHIBIT IX
Summary of Institutional Training Program

FY-1971 Sponsor/Subcontractor	No. of Trainees		Starting Date	Training Location
Charles County Community College	40		1/25/71	LaPlata, Md.
Kirkwood Community College	60		2/1/71	Cedar Rapids, Ia.
Atlanta Area Technical School	40		2/22/71	Atlanta, Ga.
Delaware State College	40		2/1/71	Dover, De.
Columbus Technical Institute	40		5/3/71	Columbus, Oh.
Brevard Community College	40		6/21/71	Cocoa, Fl.
Delgado Junior College	60		6/21/71	New Orleans, La.
Penn Valley Community College	40		6/22/71	Kansas City, Mo.
Miami Dade Junior College	30		9/7/71	Miami, Fl.
Kirkland Hall College	15		11/15/71	Easton, Md.
Charles County Community College	20		6/26/72	LaPlata, Md.
Union College	20		6/27/72	Cranford, N.J.
Kirkwood Community College	20		6/28/72	Cedar Rapids, Ia.
FY-1972				
Delgado Junior College	20		3/20/72	New Orleans, La.
Charles County Community College	25	Water		
	25	W/Water	2/3/72	LaPlata, Md.
Miami Dade Junior College	10	Water		
	30	W/Water	2/28/72	Miami, Fl.
Cedar Crest College	70		2/7/72	Goodland, Fl.
Kirkwood Community College	20	Water	2/28/72	Cedar Rapids, Ia.
Columbus Technical Institute	20		5/1/72	Columbus, Oh.
Junior College District of Metro Kansas City	20		3/1/72	Kansas City, Mo.
Denver Community College	40		5/15/72	Denver, Co.
Gulf Coast Wastewater Authority	12	Upgrade	4/2/73	Houston, Tx.
Kirkwood Community College	20	Upgrade	3/15/73	Cedar Rapids, Ia.
Mississippi Valley State College	20	Upgrade	4/9/73	
Kirkwood Community College	14		5/15/73	Cedar Rapids, Ia.
Mississippi Gulf Coast Junior College	30	Upgrade	7/1/73	Gautier, Ms.
Union College	10		6/29/73	Cranford, N.J.

[p. 61]

Graduates of the 22 or 24-week courses have been the catalyst in demonstrating that trained personnel is a most necessary com-

ponent in proficient operations of wastewater treatment plants with secondary treatment and above. Superintendents as a whole are willing and anxious to employ the trainees from the training programs.

The Institutional Program, in less than two years, shows numerous benefits: (1) Reduction in unemployed ranks; (2) a cadre of employees who are entering semi-professional careers; (3) operators better equipped to utilize the capabilities of the more sophisticated plants and; (4) state regulatory agencies have become convinced of the need and benefits derived from training. These superintendents have expressed the need for training present personnel. The market for certified operators is expanding daily.

Attempts have been made at all training sites to secure college credits for the course and to have a state certification test given near graduation date. In a survey of 75 graduates in 1973, the average starting wage was $3.27½ cents per hour. Within 9 months time this rose to $3.69 per hour. Success stories are on file where graduates have become head operators, superintendents, instructors or have been accepted in state agencies.

Two of the educational institutions have incorporated the program as part of their regular technical courses.

A need is readily observed for at least several sites to train the unemployed who are unable to enter the field because of their present habitat in relation to plants with openings and lack of funds to support their families or finance training elsewhere.

[p. 62]

The low starting wages of smaller communities are a deterrent to the unmarried who are mobile. Job placement assistance is most important in solving both the community needs and the unemployment and is valuable in staffing plants at scattered locations.

Already a few of the graduates have become instructors. A number of highly qualified ex-military teachers have graduated and are now in plant operations to gain the necessary experience in certification to become operators, thus combining two careers in one.

c. *Public Service Careers (PSC)*

With the initiation of the Public Service Careers Program, and specifically its Plan B, which is tailored to channel funds from federal agencies to state and local agencies, EPA negotiated an interagency agreement with DOL to train 1,355 disadvantaged persons newly or previously employed in wastewater treatment

plants. Five states, Texas, Virginia, South Carolina, Wisconsin, Alaska and the Virgin Islands were awarded contracts to participate in the EPA program which began in November 1970 and will cost $2,252,689.

Almost all sponsoring agencies have subscribed to the theory of upward mobility for current employees and have secured agreement from employers to furnish vacancies for entry level jobs.

This approach has resulted in an initial disproportion of entry to upgrade training. Agreement between the DOL and EPA calls for a total of 600 entry level trainees and 755 upgrade trainees. As of July 31, 1973 total enrollment in the program was 2,749 of whom 1,242 were at the entry level and 1,507 were being trained for upgrade positions.

[p. 63]

EPA's PSC Program has been extremely successful. Through the PSC 1,015 persons have been hired into and trained into entry level jobs, while upgrade training has improved the skills and raised the salaries of over 1,100 others. Although agreement commitments call for a total of 1,355 trainees this figure was exceeded by 80% upon contract termination on September 30, 1973. Throughout the program only 310 have been terminated prior to completion. PSC has been able to reach all segments of the disadvantaged spectrum including young persons, minorities, women, school dropouts and handicapped persons with a program designed to provide them with marketable job skills in a growing industry. Efforts to assist Viet Nam veterans entering the job markets have been particularly successful.

Listed below is a summary of enrollment in the PSC Program including sponsors, trainees, project start dates and locations.

[p. 64]

EXHIBIT X
Summary of Public Service Careers Program

Sponsor/Subcontractor	No. of Trainees	Starting Date	Training Location
State Board for Technical and Comprehensive Education	148 entry 144 upgrade	12/70	Columbus, SC
North Central Texas Council of Governments	276 entry 253 upgrade	11/70	Arlington, TX
Texas Water Quality Board	166 entry 166 upgrade	1/71	Austin, TX
Public Works Commission	9 entry 9 upgrade	1/71	St. Thomas, VI
Wisconsin Board of Vocational, Tech. and Adult Education	25 entry	1/71	Madison, WI
State Water Control Board	127 entry 123 upgrade	1/71	Richmond, VA
Alaska Water Laboratory	4 entry	8/71	College, AK

[p. 65]

d. *Transition Training*

Recognizing the potential manpower for water pollution control represented by returning servicemen from Viet Nam and elsewhere overseas who already have basic skills as a result of their military experience and training, EPA negotiated an interagency agreement with the Departments of HEW and Defense to establish a program of Transition Training in entry level operator positions. The purpose of the Transition Training Program is to provide veterans with marketable skills for employment in wastewater treatment plants through retraining before discharge from the service.

Over 1,300 servicemen have been trained in this program which began during November 1970.

Basic education and OJT are provided by joint facilities (military institutions in or near wastewater treatment plants and nearby academic institutions). The duration of the course is 12 weeks or 480 hours. Total cost of the program including the cost of instructors, supplies, equipment, program administration and supervision and job location assistance is $1,981,000.

In addition to managing the Interagency Agreement for Transition Training, EPA performs other related functions. First, it coordinates efforts to place successful trainees in water or water pollution control plant jobs upon their separation from the military service. EPA also has a responsibility to provide job counseling for veterans with whom they come in contact or those that contact EPA. In the future, EPA intends to encourage veterans to further their training

[p. 66]

by enrolling in a junior or community college offering a one or two-year curriculum in water and wastewater technology or by seeking employment in a treatment plant offering EPA or state/local sponsored OJT in order to qualify for higher level jobs.

Secondly, EPA, through direct contact with VA offices, encourages the Veterans Administration to channel veterans into water pollution control occupations and training programs. For example, it has distributed guidelines to VA State Agencies which approve wastewater treatment plant operator training programs recommending the following:

Option 1: Enrollment in an EPA sponsored training program if the trainee is within commuting distance of one of EPA's training projects.

Option 2: Enrollment in a training project equivalent to the EPA sponsored program which may be sponsored by a

state or local water pollution control agency if the trainee is within commuting distance of the training project.

Option 3: Enrollment in a correspondence course which could be administered by the state water pollution control agency and/or EPA's Manpower and Training Regional and Headquarters organizations if no training projects are available or accessable under Options 1 and 2.

Since the last report to the Congress EPA has started new training programs in the Far East and in Europe. The first project was started in Okinawa. EPA, in cooperation with the Department of Defense branched out into two additional areas; one in Korea and one in the Philippines. Subsequently, four additional sites were added in Germany and one in England. EPA has just completed negotiations

[p. 67]

for a new Military Transition Program for $650,000. Listed below is a summary of the Transition Training Program:

[p. 68]

EXHIBIT XI
Summary of Transition Training Program

Sponsor/Subcontractor	No. of Trainees	Starting Date	Military Installation
Charles County Community College, LaPlata, MD	70	11/9/70	Ft. Belvoir, VA
Fayetteville Technical Institute, Fayetteville, NC	70	12/7/70	Ft. Bragg, NC
El Paso Independent School District, El Paso, TX	70	12/1/70	Ft. Bliss, TX
Central Texas College, Kileen, TX	70	1/18/71	Ft. Hood, TX
Orange Coast Community College, Costa Mesa, CA	30	1/11/71	El Toro Marine Base
Contra Costa Community College District, Martinez, CA	40–48	9/7/71	Treasure Island, NAS, CA
Sinclair Comm. College, Dayton, Ohio	40–48	9/7/71	Wright-Patterson AFB
Clover Park Voc. Tech. Inst., Tacoma, Washington	30	7/12/71	McCord AFB
San Diego Comm. College District, San Diego, CA	40–48	8/16/71	San Diego NAS
Sumter Area Tech. Ed. Center, Sumter, SC	40–48	7/26/71	Shaw AFB
Charles County Community College	40	1/72	Andrews AFB
Wayne County Community College	40	2/72	Seymour Johnson
Orange Coast Community College	40	1/72	El Toro
University of Kentucky	40	2/72	Fort Knox
Neosho	156	5/72	Far East
University of Hawaii	30	5/72	Schofield Barracks
Kirkwood Community College	104	10/72	Europe
Kirkwood Community College	60	2/73	Europe
Charles County Community College	60	2/73	Andrews AFB
Clover Park Voc. Tech. Inst.	40	2/73	McCord AFB
San Diego	30	3/73	San Diego NAS
Neosho	60	5/73	Far East
Hawaii	30	5/73	Schofield
Orange Coast Community College	30	5/73	El Toro

[p. 69]

e. *Work Incentive (WIN–II)*

The EPA has just negotiated an Interagency Agreement with the Department of Labor for a Work Incentive Program (WIN–II). This program is funded for $1,000,000 and designed to provide

remedial education and skill training for 700 adult welfare recipients on Aid to Families with Dependent Children (AFDC). The program objectives are to train and provide job development assistance in placing trainees in established budgeted positions in public or quasi-public agencies.

It is estimated that there will be five local project sponsors. The scope of this program will include training for over 400 in water and wastewater or related occupations. The remainder will be trained in other pollution areas.

[p. 70]

2. *Internally Funded*

To date, Subsection 104(g) (1))—formerly Subsection 5(g) (1)) of the Act—which authorizes a pilot program for supplemental manpower development and training programs for persons entering into operations and maintenance of treatment works and related activities, has been used to provide update and upgrade training for existing plant operators. Training was also provided for Training Program Instructors, and for specialized courses in advanced Waste Treatment. Since the program's inception with FY 1971 supplemental funds, 138 Grants have been awarded to 40 States and 15,800 Trainees from all 50 States plus the District of Columbia, Puerto Rico, and the Trust Territory, have been trained.

Section 104(g)(1) training is summarized below:

Program	*Total Trainees*	*Total Amount*
State Operator Training Programs	13,200	$2,100,000,00
National Impact Programs and Special Programs	2,100	1,160,000.00
	15,300*	$3,260,000.00

The Pilot Program to date has:

Established a mechanism to initiate quickly the training necessitated by an accelerated program.

Provided an initial framework upon which the States can build and for which they can eventually assume responsibility.

Summary descriptions of each program appear in Exhibit XII.

*Includes trainees also reenrolled in short courses and correspondence courses.

[p. 71]

(A) STATE OPERATOR TRAINING GRANTS

A wide range of operator training needs has been identified by State Water Pollution Control and other Public Agencies across the Country. Given the availability of funds under the Pilot Program, the States were asked to suggest innovative projects representing their most compelling needs. Each EPA Region then selected at least one Training Project to answer the State's as well as Regional Priorities for development and implementation, based on the following criteria:

—Replicability
—Geographic Diversity
—Potential for Problem Solving
—Coverage (For example, management Training for Supervisory Personnel, electrical and instrumentation courses, field study, correspondence and so forth).

To date, 114 Grants have been awarded to 39 States, Puerto Rico and the Trust Territory for the development and implementation of operator and operations—related training programs. These projects cover the following major needs among the several States:

(i) Management training for first-line supervisors to expand and upgrade administrative skills of persons involved in operation and maintenance of wastewater treatment facilities to improve overall plant efficiency and personnel performance.

(ii) Phosphorous reduction training programs. These programs must assist in demonstrating feasible control processes because states are now legislating for phosphrous reduction.

(iii) Electrical and instrumentation courses for plant personnel to provide expertise in preventing plant shutdown as a result of minor electrical and instrumentation problems; in other words, preventive maintenance training in these critical areas.

[p. 72]

(iv) General skill improvement training for higher level plant personnel (operators and technicians). Most of our training effort falls in this category.

(v) Information and orientation seminars for local officials and policy decision-makers to demonstrate their

unique function in the solving of pollution problems in their own sectors.

(vi) Mobile laboratory programs have been initiated in cooperation with the Department of Labor to provide more extensive laboratory methods to operators who either are unable to attend on-going programs or have inadequate laboratory facilities at his own plant. The municipal decision makers are also able to observe what equipment is necessary to perform the required tests to meet Permit standards.

(vii) Certification programs to update and upgrade operators in order to pass mandatory certification tests as each state enacts their mandatory certification laws.

(viii) Water supply system programs to train operators of potable or drinking water systems. Four grants were tendered in this area. Also, many small town operators have responsibility for both water and wastewater treatment and require training in both areas.

(ix) *Small Plant* (usually extended aeration package plants) and lagoon training in a short-course format for the small town operator.

(x) *Minority Programs.* In answer to a need to provide training to Blacks, Indians, and Spanish-speaking operators. Several special programs have been provided at minority institutions and various agencies to provide training in a special manner. These programs have helped in retaining minorities and providing career opportunities heretofore unavailable at the entry level.

Each state conducts its own training programs or selects a designate agency for its performance. EPA provides technical assistance at the request of the State and monitors programs periodically to assure program compliance.

[p. 73]

Approximately 13,200 trainees have participated in these programs at a cost of $2,100,000 since the program's inception in July of 1971.

(B) NATIONAL IMPACT PROGRAMS AND SPECIAL PROGRAMS

Twenty-four grants were tendered to various agencies to develop programs under the National Impact and Special Project

portion of our activity. These grants were made to various institutions to develop projects that were national or interregional in scope and were considered prototypes with national implications. The lessons learned were to be useful for all training programs throughout the country. The method helped us to avoid "reinventing the wheel" in duplicating innovative programs with national applicability in several states rather than using the results and disseminating them to interested states individually. Types of programs developed under this category are as follows:

(1) Curriculum and materials development programs to keep abreast of improvements in the state of art and to disseminate these curricula and materials to the various training efforts in the several states.

(2) Correspondence Field Study program to reach plant personnel in hard to reach areas unable to participate in on-going training programs. For this purpose a grant was made to the University of California to administer this training course for over 4,000 operators at no cost to the trainee.

(3) Plant start-up training to operators in the Trust Territory for newly constructed plants on various islands. This program was developed to observe if intensive training were given prior to start-up, we might avoid the initial drop-off in plant efficiency during the first year shake down.

[p. 74]

(4) Specialized Training in Advanced Wastewater Treatment. When the Pilot Program was authorized, few programs on advanced wastewater treatment operations were offered at the State and local levels. EPA awarded two grants under the Pilot Program for development of two advanced experimental and demonstration projects to provide intensive technical training in the operation of wastewater treatment processes for advanced waste treatment operators, treatment plant supervisory personnel, public works department personnel, and others with a need for such training. Both recipients of these grants, the Tennessee Department of Public Health and the Texas Engineering Experimental Station, were selected on the basis of the unique contribution they could make to the program. Both contractors have well-qualified staff personnel capable of conducting the programs. The total cost of the two advanced wastewater treatment programs, including trainee subsistence

and travel, will be approximately $305,000.00. Each of these programs is discussed briefly below.

a. *Tennessee Program.* The State of Tennessee is in an area currently moving from primary to secondary treatment, and the State Department of Public Health was in the process of establishing a training laboratory, usable for such courses, at the time the grant was awarded. The program is regional in concept and is designed to reach 60 trainees from states in the southeast region of the United States. Enrollees receive four weeks of classroom instruction, followed by on-site plant visits. Participants from the State of Tennessee will receive additional on-the-job training over a four-week period following the classroom phase of the program. The pilot program will be used to develop a blueprint for similar regional and State programs.

b. *Texas Program.* The Texas Engineering Experimental Station, with a large research and development investment, is in one of several states moving from secondary to tertiary treatment; it already had a training laboratory at the time of the grant award. The Texas program was regional in concept at inauguration but was designed to become national as it developed. The program will provide training in advanced wastewater treatment to 130 participants

[p. 75]

from several sections of the nation, especially for plant personnel from systems utilizing (or soon to utilize) advanced treatment processes. Courses will be conducted in several locations throughout the nation and the Texas Experimental Station.

(5) Advanced Instructor Training. Instructors of the basic operator training courses also required upgrade training in advanced teaching techniques to instruct these and higher level training programs. A pilot project was initiated to satisfy this compelling need.

This project, referred to as Phase II and III Instructor Training, provides advanced education techniques to operator training instructors who have already learned basic education skills. It represents a refinement of the basic Phase I training course currently offered under EPA's Technical Training Program. The course emphasizes motivation, sensitivity training, design of effective instructional techniques, and evaluation and utilization of learning resources.

Grants were awarded to an association of instructors and to Drake University to develop and conduct this training, which began in June 1971. To date 150 instructors have enrolled in the course. Participation in the course provides the advantages of contact with professional educators, more sophisticated education skills, and the opportunity for both college credit and upgrading of instructor credentials.

(6) National decision-maker workshop to demonstrate to 100 selected State officials who could carry the program ideas back to their individual states and implement these programs with their own municipal decision makers.

(7) Federal Agency Operators Training Program. To take specific area training programs to the operators of treatment facilities in the National Parks and U.S. Forests as requested by operations and Maintenance Engineering personnel of these two respective agencies.

National Impact programs and Special Projects have provided training for 2100 persons at a cost of $1,160,000 since July of 1971. Twenty four separate programs were implemented.

[p. 76]

EXHIBIT XII
SUMMARY OF INTERNALLY FUNDED TRAINING PROGRAMS

I. National Impact Programs and Special Projects

Grantee	Training Site	Amount of Grant	Starting Date	Number of Trainees	Summary of Training Program
Charles County Community College	La Plata, Maryland	104,667	7/1/71	0	A program to develop waste treatment plant standard operating procedures and technical training materials related to waste treatment plant operations.
Drake University	Des Moines, Iowa	54,174	6/1/71	50	Improve the instructional skills of trainers; emphasis on motivation, sensitivity training, designing effective instructional practice, and evaluation and utilization of learning resources. Three year program.
Association of Clean Water Teachers and Instructors of our Nation (ACTION)	Costa Mesa, California	20,000	7/1/72	20	Training Course for Instructors, to precede the Drake Univ. Course, which will stress technical updating in a workshop format.
U. of Calif. at Sacramento	Throughout USA	71,550	7/1/72	4,133	Field Study Correspondence Course distribution for hard to reach, and rural operators unable to attend on-going training program (2 yr. program).
Texas Water Quality Board	Various Plants and Labs in Texas	87,000	7/1/72	384	Upgrade program for 384 Mexican-American operators. Two-year project with part of funds furnished by DOL.
North Central Texas Council of Governments	NCTOG Training Center, Dallas	55,000	7/1/72	80	Upgrade 80 Spanish Surnamed operators in the GED and providing training to assist operators to pass mandatory certification exams.
El Paso Comm. College	Colorado Springs, Colorado	23,750	7/1/72	20	Certification upgrade program for 20 Mexican–American Surnamed operators in Southern Colorado. [p. 91]
Tennessee Dept. of Public Health	Middle Tenn. University	159,407	6/1/71	60	Demonstrate innovative and unique training procedures for the operation, maintenance, and control of advanced biological waste treatment processes and facilities. These pilot program training methods will be utilized in developing regional or national programs. 3 year project.
Texas Engineering Experiment Station	Dallas Water Reclamation Research Center	101,164	7/1/71	130	Two year training program including: 5-day courses in chemical-physical waste treatment processes utilizing a pilot plant for providing intimate operating experience. Special operational instruction in activated sludge and AWT maintenance and control.
Kirkland Hall College	Easton, Maryland	22,627	8/15/71	0	A program to correlate information from four state decision-maker projects and prepare for a national conference.
Kirkwood Community College	Annapolis, Maryland	82,060	4/1/72	100	Implementation of National decision maker workshop. 100 selected state officials met to receive instruction on how to carry on program in their own state.

EXHIBIT XII
SUMMARY OF INTERNALLY FUNDED TRAINING PROGRAMS—Continued

Grantee	Training Site	Amount of Grant	Starting Date	Number of Trainees	Summary of Training Program
Kirkwood Community College	Washington, D.C.	40,270	2/1/73	0	Provide consulting expertise to follow-up in assisting state decision maker programs to plan and implement state programs.
Technical School	Various Gov't Installations	100,347	6/1/72	360	2 year project to provide training to operators of Federal facilities treatment plants. Instructors go to a site selected by U.S. Forest Service and National Parks and train in a preselected training need.
Kirkwood Community College	Cedar Rapids, Iowa	30,000	2/1/73	30	Project to retrofit 6 donated US Army trucks as mobile laboratories and train instructors in proper use of vehicles and laboratories.
Association of Clean Water Teachers and Instructors	Seattle, Washington	10,000	6/1/73	200	Provide coordination for National Water and Wastewater Operator Training Instructors Workshop in November.
					[p. 78]
National League of Cities	Washington, D.C.	20,000	5/15/72	0	Grant tendered to develop a network of National League staff people in various cities to be a contact for trainees seeking employment after completion of training and to distribute training information to municipal officials.
Neosho Technical School	Neosho, Missouri	25,300	2/1/73	30	Provide scholarship funds to US Military Transition Program graduates from Overseas. 6 months of intensive full time training is given to each trainee.
Kirkwood Community College	Cedar Rapids, Iowa	19,966	2/15/73	0	Feasibility study program to present a plan to interested states in implementation of Section 109(b) of Public Law 92–500—building a $250,000 state training center.
Association of Boards of Certification	Washington, D.C.	19,980	1/1/73	0	Program to assist this Board to perform an alignment of certification criteria throughout the US as regards examinations, staffing and classification.
Alcorn A & M	Mississippi	18,455	7/1/73	16	A minority school program to train Black laboratory and operations personnel in Water and Wastewater Treatment plants.
Durham College	Durham, North Carolina	33,506	6/8/71	50	A training program to provide instruction to Minority plant personnel in order to upgrade them and assist them in obtaining certification as plant operators. 3 year program.
California Institute of Local Self-Government	Throughout State	19,968	5/22/72	500	A series of 8 seminars to acquaint local decision makers with problems associated with Water Pollution and the training required of operators to solve problems.
Institute of International Education	New York, N.Y.	10,000	4/1/72	0	A grant to assist in compiling an International Directory of Environmental Study Programs. Several Foundations plus EPA combined in the effort.
					[p. 79]

Institute of Social Technology	Barranquitas, P.R.	5,000	7/1/72	50	Supplementing existing program to increase the awareness of educational leaders in Puerto Rico to the importance of having trained operational personnel in environmental efforts.
		State Operator Training Programs			
			Region I		
New England Inter-State Water Pollution Control Commission	Mobile Lab	150,165	6/28/71	380	Utilizing a Mobile Laboratory throughout New England for the training of wastewater treatment plant operators and related activity personnel to increase the operating efficiency of existing wastewater treatment facilities and sewage collection systems through the upgrading of skills of present employees. 3 year program, plus a program to train operators to become in-house training instructors.
Maine Dept. of Health & Welfare	Water Facilities in Maine	25,145	1/20/72	30	Two-22 week courses of classroom and OJT in the operation of drinking water plant operations. New State certification requirements forced a need for update training.
Vermont Dept. of Health	Technical Colleges	32,460	12/31/72	130	A series of two day short courses to prepare water system *plant operators to pass mandatory certification.*
			Region II		
New York Dept. of Environmental Conservation	New York City, Buffalo, Syracuse	129,400	6/14/71	1,300	A series of five Grants for the training of Water and Wastewater Treatment Plant Operators in order to update and upgrade them to meet state certification requirements. One and two week short courses including plant safety.
Bronx Community College	Bronx, N.Y.	5,756	4/1/72	40	A program to assure an adequate supply of trained operators by focusing on High School Juniors in a summer course for technically oriented students.
					[p. 80]
Middlesex Community College	Edison, New Jersey	6,430	4/1/72	160	Four 2-day seminars at various locations to train operators in AWT methods, package plant operations, instrumentation analysis.
Puerto Rico Aqeduct and Sewer Authority	San Juan, P.R.	5,500	7/1/71	48	A supplemental effort to an existing CAMPS training program to update existing authority plant personnel in the latest treatment methods.
New York U. at Delhi	Delhi, N.Y.	13,264	7/1/73	200	One state-wide and two territorial decision maker seminars to train local officials in new requirements to be implemented due to new Water Pollution Control Act.
			Region III		
Charles County Community College	La Plata, Maryland	15,111	9/1/71	120	**Project A**—Seminars for State and local elected officials to provide information concerning water pollution control programs, legislation, regulations, and fundamental of wastewater plant operations, and maintenance including the need for well-trained personnel to operate the plants. **Project B**—Training program for State and local regulatory

EXHIBIT XII
SUMMARY OF INTERNALLY FUNDED TRAINING PROGRAMS—Continued

Grantee	Training Site	Amount of Grant	Starting Date	Number of Trainees	Summary of Training Program
					personnel Or WPC plant personnel concerning practical aspects of water pollution control and plant operation and maintenance, including WPC plant inspection and evaluation procedures.
Maryland Environmental Services	Hagerstown, Maryland	6,600	5/15/72	40	Wastewater treatment plant operator lab training course. Instruction in sampling, usage, analysis, and calculations, and performance of eleven specific tests and recording.
City of Baltimore	Baltimore, Maryland	13,491	3/5/73	60	A water supply treatment operator training course. Safety training for 40 operators and in-depth scientific skill upgrading for 20 operators.
West Virginia Dept. of Health	5 State Locations	18,202	1/14/72	100	Public water supply operator training course for Class III Operators to pass mandatory certification exams. 3 hours per week for 8 weeks classroom and 15 hours OJT.
					[p. 81]
Virginia State Water Control Board	Several State Locations	57,000	7/1/71	1,070	A multi-faceted 3 year operator training program to update existing plant operators to meet new State and Federal operational requirements. Sewerline inspection personnel were also trained in installation requirements.
Pennsylvania Dept. of Education/Public Service Institute	Harrisburg, Pennsylvania (various schools)	80,825	6/9/71	2,600	A 3 year continuing program to improve skills of present employees in the wastewater treatment field, necessitated by Act 322, Commonwealth of Pennsylvania Certification Act. Both operators and Pennsylvania Dept. of Environmental resources employees receive training.
			Region IV		
N. Carolina Dept. of Natural and Economic Resources	Municipal Labs	6,500	4/1/72	20	Program for higher grade professional operators in lab techniques as well as supervisory and management training.
Mississippi Valley State College	Itta Bena, Miss.	20,252	4/15/72	15	Minority school project emphasizing lab training program for entry level personnel. 104 hours of classroom, 64 hours of lab and 32 hours of OJT for each trainee.
Greenville TEC	Greenville, S. Carolina	9,218	5/30/72	32	Wastewater treatment plant laboratory personnel trining. 2 fold program to prepare instructional materials and procedures and to upgrade and update lab personnel.
Georgia Water Quality Control Board	Municipal Plants	31,960	6/2/71	30	Skill improvement and operators upgrade program. Instruction in plant unit operations, science, math & communications, each trainee will have 168 hours of classroom and 53 hours of OJT.

Piedmont Technical Education Center	Greenwood, South Carolina	2,510	7/1/71	30	Three 8-hour days of concentrated effort in the areas of human aspects of management, with emphasis on the human needs of those being managed, increasing human value, making better use of time, how to motivate people, problems of temperment, how to predict human behavior, and individual communication.
					[p. 82]
Jefferson County Commission (Eng. Dept.)	Birmingham, Alabama	20,960	7/1/71	25	Improve the skills and upgrade present wastewater treatment plant operators. The trainee will receive basic education in areas of math, communications, science, and plant unit operations with the goal of adding substantially to the proficiency of persons at all levels of waste treatment operations.
Trade and Industrial Education	Local school conference rooms	2,544	6/15/72	1,000	A grant to supplement an on-going upgrade program being carried on by the State. Program consists of one-week short courses on itinerant basis throughout the State.
South Carolina Pollution Control Authority	Various vocational-technical schools	19,950	2/1/73	460	Upgrade program for treatment plant operators. 17 week course of 3 hours per week, taught through State's Technical Education Division.
Florida State Dept. of Pollution Control	Tampa, Florida	15,005	1/1/73	60	Two-fold operator training program. First portion for new uncertified operators and the second for advanced waste treatment for certified operators.
Georgia Dept. of Natural Resources	Waycross, Georgia	16,816	2/1/73	20	OJT wastewater treatment plant operator training course to upgrade the talents of new-hires into the field. 168 hours of classroom and 40 hours of OJT per trainee.
North Carolina University at Charlotte	Charlotte, N.C.	13,606	4/1/73	60	A pilot program to upgrade the operating skills of existing plant operators in the Charlotte area. 72 hours of classroom and field trips plus one week intensive review prior to certification exam.
Piedmont TEC	Greenwood, S.C.	2,510	7/1/71	30	*Human factors management training for first-line supervisors.* Three 8 hour sessions.
Greenville TEC	Greenville, S. Carolina	16,884	7/1/72	12	Supervisory personnel at Wastewater treatment plants will be trained in theory, supervisory responsibilities, and in-house training capabilities.
					[p. 83]
Univ. of Kentucky Research Found.	Lexington, KY.	43,897	7/1/71	10	Three year continuing program to train entry-level and existing operating personnel, and improve skills of lab personnel so they can perform required analyses of new or proposed standards and update and upgrade existing plant operators with classroom and OJT. Mobile lab training for trainees who cannot attend on-going program.
Mobile Water Service System	Mobile, Alabama	22,500	6/30/73	40	A two-year continuing program consisting of two 24-week sessions on the operation and maintenance of the electrical equipmet control and instruments in use at the Mobil Water Service Waste Treatment and Handling facilities.

EXHIBIT XII
SUMMARY OF INTERNALLY FUNDED TRAINING PROGRAMS—Continued

Grantee	Training Site	Amount of Grant	Starting Date	Number of Trainees	Summary of Training Program
The Kentucky Municipal League	Kentucky State Parks	7,994	7/1/71	200	Educate municipal officials and "decision-makers" as to the importance of water quality control in view of new standards. Students would be shown the importance of well-trained operating personnel in their wastewater treatment facilities in order to meet their obligations in the field of water quality control.
City of Jackson	Jackson, Mississippi	15,434	3/1/73	30	To train 30 operators in activated sludge treatment for a new $15,000,000 plant in Jackson.
					[p. 84]
			Region V		
Michigan Dept of Public Health	Lansing, Michigan	142,313	4/1/72	350	8 weeks of training on operation, control and maintenance of phosphorus removal from sanitary wastewater. Two-phase program: Phase A consists of one day (or half day) classroom instruction each week for 7 weeks. Phase B consists of a five-day week on lab instruction of analystical techniques needed for control of the process. Second year continuation stressed operator training in activated sludge wastewater treatment processes.
Minnesota Pollution Control Agency	Area Vocational Schools	31,555	4/1/72	300	A two year program combining small treatment plant operator training and an advanced class for operations in activated sludge training.
Wisconsin Dept. of Natural Resources	U. of Wisconsin Extension Service	24,920	4/1/72	80	A program to upgrade presently certified operators to grades I & II to meet new plant classification requirements. Involves 2½ weeks of classroom and lab instruction.
Illinois EPA	State Wide Plants	22,475	5/15/72	80	A program to fund state staff member to be an itinerant instructor to provide follow-up on Field Study course participants.
Detroit Metro Water Dept.	Detroit, Mich.	29,000	3/15/73	20	A Program to develop the skills of middle-management personnel who will be making unit process control decisions in regard to the Pure Oxygen process prior full scale operations at advanced waste treatment facilities.
					[p. 85]
New Mexico Environmental Improv. Agency	Navajo Reservation	37,800	5/1/72	165	To provide training to water and wastewater treatment system personnel on and surrounding the Navajo Reservation. Cooperative effort with Federal, State and Tribal Agencies.
Texas Water Quality Board		12,175	4/1/73	140	A series of seven three-day Decision Maker Workshops to train municipal water utilities managers in the fundamentals of presenting a community awareness program.

			Region VII		
University of Missouri	Columbia, Missouri	11,931	6/1/71	300	Series of one-day seminars to orient local officials and citizens regarding the State-local-Federal responsibilities for wastewater management.
Central Nebraska Tech. College	Hastings, Nebraska	30,000	7/1/71	20	Development and implementation of curricula designed to develop adequate and appropriate educational competencies for personnel responsible for the prevention of contamination of water resources by those hazardous materials which endanger human health and environment.
Kansas State Dept. of Health	Topeka, Kansas	20,407	6/30/73	200	Provide a training director to State staff to expand and improve training opportunities to plant operators in order to provide a transition from voluntary to mandatory certification.
Missouri Water Pollution Control Board	Municipal labs	21,900	4/1/72	60	An upgrade training program for wastewater treatment plant operators throughout the State. Will stress actual laboratory procedures and analysis to meet new regulatory requirements.
					[p. 87]
Iowa Dept. of Environ. Quality	Municipal facilities	39,601	4/1/72	130	Provide a member on State staff to coordinate all water and wastewater training efforts in the State. Will concentrate on participants in field study correspondence course.
Neosho Technical School	Jefferson City and Springfield, MO.	3,700	5/1/72	40	Two one-week short courses on lagoon operation prior to State certification exam.
Nebraska State Dept. of Environ. Control	Municipal plants	23,280	5/1/73	50	Utilize a full-time training specialist to coordinate wastewater treatment plant operator training in the State, plus provide a manpower planning capability to the State Agency.
					[p. 88]
Curators of the Univ. of Missouri	Vocational centers	18,605	7/1/72	750	A specialized training effort to tie-in the effects of soil erosion and sedimentation to treatment plant activities. Trainees will be vocational teachers and material will be provided to them to dispense through area training courses.
Neosho Technical School	Jefferson City, MO.	5,725	4/1/73	45	Sewage treatment lagoon operator training course to develop instructional criteria to be presented in courses throughout Region VII. Three one week short courses coordinated with certification exams.
Neosho Technical School	Neosho, MO.	2,500	6/1/73	20	Pilot program to instruct plant engineers in plant operations. Design engineers will be given a one week intensive program to acquaint them with operational difficulties to improve their designs.
Missouri Clean Water Commission	Municipal labs	16,860	7/1/73	80	A laboratory training program designed to improve the skill of operators in performing wastewater analysis. Classroom and OJT will be employed.

EXHIBIT XII
SUMMARY OF INTERNALLY FUNDED TRAINING PROGRAMS—Continued

Grantee	Training Site	Amount of Grant	Starting Date	Number of Trainees	Summary of Training Program
			Region VIII		
Colorado Water Pollution Control Division	Grand Junction, Colorado	46,578	7/1/71	250	Three year program to provide a trained coordinator who will organize and conduct a training program for scattered wastewater treatment plant operators utilizing classroom and OJT instruction for 250 trainees. The coordinator will work with the State Vocational Education Department and Community Colleges to assist the program and provide additional training opportunities. [p. 89]
Wyoming Department of Environ. Quality	Cheyenne, Casper, Laramie, Wyoming	28,671	6/1/72	20	A two year media development program utilizing an innovative presentation procedure using television sets and tape players placed in a plant for instructional purposes.
Montana Dept. of Health and Envir. Sciences	Municipal facilities	43,050	4/1/72	65	Provides 72 hours of classroom, 100 hours of correspondence study, and 40 hours of individual OJT for each trainee in small plant operator training.
North Dakota Dept. of Health	Municipal facilities	24,325	42	45	Operator training program for small plants consisting of three 12 week courses for 14 operators in each session.
			Region IX		
California State Water Resources Control Board	San Marcos, Calif.	230,819	5/1/71	505	Training of wastewater treatment plant operators and related activity personnel to improve substantially their proficiency in operating, maintaining, supervising, designing, and managing facilities through a "problem-oriented" approach to environmental enhancement. Training site will include an operating wastewater treatment facility.
Department of Public Works Trust Territory	Honolulu and Pacific Islands	80,000	4/5/72	15	Long term training program to supply trained operating personnel for newly constructed treatment works throughout Trust Territory. Trainees go to Hawaii for training then return to islands to operate new plants. [p. 90]
			Region X		
City of Portland	Portland, Oregon	13,635	6/1/73	20	A program to train present plant personnel in activated sludge processing. A new plant is being constructed and all operators require start-up training. 160 hours of instruction and 960 hours of OJT.
Washington Dept. of Social and Health Services	Tacoma and Spokane	3,750	4/1/72	40	Assist State to provide in-depth training for 40 specialists on the installation, operation and maintenance of cross-connection control backflow prevention devices.

Linn-Benton Community College	Albany, Oregon	135,909	7/1/71	240	Provide present wastewater treatment plant operators with the perspective and training necessary to make a contribution to the solution of environmental problems caused by modern wastewater treatment plants not being operated and maintained at peak efficiency. Modular concept of instruction over a two year period.

[p. 91]

4.8d Memorandum of Understanding Between the Environmental Protection Agency and the Department of Transportation Concerning the Definition of Transportation Related and Non-Transportation related Facilities as Used In Executive Order 11548.

This memorandum establishes policies and guidelines relating to the definition of transportation and non-transportation related onshore and offshore facilities and the responsibilities of the Environmental Protection Agency and the United States Coast Guard with respect to the prevention of oil discharges from vessels and onshore and offshore facilities.

SECTION I

GENERAL

1. Section 11(j)(1)(C) of the Federal Water Pollution Control Act, as amended authorizes the President to issue regulations consistent with maritime safety and with marine and navigation laws establishing procedures, methods and requirements for equipment to prevent discharges of oil from vessels and onshore and offshore facilities.

2. This authority was delegated by the President in Executive Order 11548. Section 1 of that Executive Order delegates responsibility and authority to the Secretary of the Interior to carry out the provisions of subsection (j)(1)(C) of section 11 of the Act after consultation with the Secretary of Transportation relating to procedures, methods and requirements for equipment to prevent discharges of oil from non-transportation related onshore and offshore facilities. The authority delegated to the Secretary of the Interior was subsequently vested in the Administrator of the Environmental Protection Agency in Reorganization Plan No. 3 of 1970 and Section 9 of Executive Order 11548.

3. Section 2 of Executive Order 11548 delegates responsibility and authority to the Secretary of Transportation in consultation with the Secretary of the Interior, to carry out the provions of subsection (j)(1)(C) of Section 11 of the Act relating to procedures, methods and requirements for equipment to prevent discharges of oil from vessels and transportation-related onshore and offshore facilities. The Secretary of Transportation in turn redelegated this authority to the Commandant, U.S. Coast Guard.

4. Although Executive Order 11548 divided responsibility and authority into transportation-related and non-transportation-

related facilities, no indication of the extent of transportation relation is given. In the broadest sense every facility is transportation related. Any activity that can possibly discharge oil must transport materials to some extent and have materials transported either to, from or by the facility.

5. In distinguishing between transportation related and non-transportation related facilities, a systems approach was utilized. It is recognized that the life-cycle of oil is characterized by various operations conducted at many different types of facilities. Most facilities necessarily engage in more than one type of operation. These operations include drilling, producing, refining, storing, transferring, transporting, using and disposing. To the extent possible and considering agency resource capabilities and expertise, it is considered most practical to assign one agency the responsibility for regulating a complete operation at any one facility. The Department of Transportation will generally be responsible for regulating the transferring of oil to or from a vessel at any facility including terminal facilities; the transporting of oil via highway, pipeline, railroad or vessel; and certain storing operations. The Environmental Protection Agency will generally be responsible for regulating drilling, producing, refining, storing, disposing and certain transferring operations at various types of facilities.

6. While the following definitions are intended to be as specific and inclusive as possible, it is recognized that certain problems concerning these definitions will arise from time to time requiring the cooperation and agreement of the Department of Transportation and the Environmental Protection Agency for resolution.

SECTION II

DEFINITIONS

The Environmental Protection Agency and the Department of Transportation agree that for the purposes of Executive Order 11548, the term—

(1) "non-transportation-related onshore and offshore facilities" means

(A) fixed onshore and offshore oil well drilling facilities including all equipment and appurtenances related thereto used in drilling operations for exploratory or development wells, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(B) mobile onshore and offshore oil well drilling platforms, barges, trucks, or other mobile facilities including all equipment and appurtenances related thereto when such mobile facilities are fixed in position for the purpose of drilling operations for exploratory or development wells, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(C) fixed onshore and offshore oil production structures, platforms, derricks, and rigs including all equipment and appuretenances related thereto, as well as completed wells and wellhead equipment, piping from wellheads to oil separators, oil separators, and storage facilities used in the production of oil, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(D) mobile onshore and offshore oil production facilities including all equipment and appurtenances related thereto as well as completed wells and wellhead equipment, piping from wellheads to oil separators, oil separators, and storage facilities used in the production of oil when such mobile facilities are fixed in position for the purpose of oil production operations, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(E) oil refining facilities including all equipment and appurtenances related thereto as well as in-plant processing units, storage units, piping, drainage systems and waste treatment units used in the refining of oil, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(F) oil storage facilities including all equipment and appurtenances related thereto as well as fixed bulk plant storage, terminal oil storage facilities, consumer storage, pumps and drainage systems used in the storage of oil, but excluding in-line or breakout storage tanks needed for the continuous operation of a pipeline system and any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(G) industrial, commercial, agricultural or public facilities which use and store oil, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(H) waste treatment facilities including in-plant pipelines, effluent discharge lines, and storage tanks, but excluding waste treatment facilities located on vessels and terminal storage tanks and appurtenances for the reception of oily ballast water or tank washings from vessels and associated systems used for offloading vessels.

(I) loading racks, transfer hoses, loading arms and other equipment which are appurtentnat to a non-transportation related facility or terminal facility and which are used to transfer oil in bulk to or from highway vehicles or railroad cars.

(J) highway vehicles and railroad cars which are used for the transport of oil exclusively within the confines of a non-transportation related facility and which are not intended to transport oil in interstate or intrastate commerce.

(K) pipeline systems which are used for the transport of oil exclusively within the confines of a non-transportation related facility or terminal facility and which are not intended to transport oil in interstate or intrastate commerce, but excluding pipeline systems used to transfer oil in bulk to or from a vessel.

(2) "transportation-related onshore and offshore facilities" means

(A) onshore and offshore terminal facilities including transfer hoses, loading arms and other equipment and appurtenances used for the purpose of handling or transferring oil in bulk to or from a vessel as well as storage tanks and appurtenances for the reception of oily ballast water or tank washings from vessels, but excluding terminal waste treatment facilities and terminal oil storage facilities.

(B) transfer hoses, loading arms and other equipment appurtenant to a non-transportation related facility which is used to transfer oil in bulk to or from a vessel.

(C) interstate and intrastate onshore and offshore pipeline systems including pumps and appurtenances related thereto as well as in-line or breakout storage tanks needed for the continuous operation of a pipeline system, and pipelines from onshore and offshore oil production facilities, but excluding onshore and offshore piping from wellheads to oil separators and pipelines which are used for the transport of oil exclusively within the confines of a non-transportation related facility or terminal facility and which are not intended to transport oil in interstate or intrastate commerce or to transfer oil in bulk to or from a vessel.

(D) highway vehicles and railroad cars which are used for the transport of oil in interstate or intrastate commerce and the equipment and appurtenances related thereto, and equipment used for the fueling of locomotive units, as well as the rights of way on which they operate. Excluded are highway vehicles and railroad cars and motive power used exclusively within the confines of a non-transportation related facility or terminal facility and which are not intended for use in interstate or intrastate commerce.

SECTION III

COORDINATION AND ENFORCEMENT

The above definitions have been developed to facilitate the development and enforcement of regulations for prevention of oil discharges and to correspond as much as possible to the existing responsibilities of the Department of Transportation and the Environmental Protection Agency. It is recognized, however, that in some situations the Department of Transportation may have expertise that could be helpful to the Environmental Protection Agency in the development or enforcement of these regulations and vice versa. Such a situation might arise in connection with the regulation of the non-transportation related facilities included within definitions 1(J) and 1(K) in section II above. It is agreed that in such situations the Department of Transportation and the Environmental Protection Agency will provide assistance to and coordinate with each other in the development and enforcement of the regulations to the extent that existing resources permit.

FOR THE DEPARTMENT OF TRANSPORTATION

FOR THE ENVIRONMENTAL PROTECTION AGENCY

4.9a. "Clean Water," Report to Congress, Environmental Protection Agency, May 1973.

Dear Mr. President:
Dear Mr. Speaker:

I am pleased to transmit to the Congress, as required by Section 516(a) of the Federal Water Pollution Control Act, the first of a series of annual reports covering measures taken to implement the objectives of the Act..

The scope of this first report for calendar year 1972 is

restricted—essentially it is confined to the nine subject areas listed in Section 516(a).

Future reports of the series are expected to be more comprehensive in scope and balanced in presentation. They will include coverage of water quality required by Section 104(a)(5) and sewage flow reduction required by Section 104(o)(2).

Sincerely,
Robert W. Fri
(Acting) Administrator

Honorable Spiro T. Agnew
President of the Senate
Washington, D.C. 20510

Honorable Carl B. Albert
Speaker of the House of Representatives
Washington, D.C. 20510

CONTENTS

I. INTRODUCTION

The Nation's policies for the achievement of water quality suitable for many purposes have evolved through six legislative enactments since the passage in 1948 of the initial Water Pollution Control Act. The evolution of our water quality laws has brought with it the development of a wide range of related activities in financial and technical assistance, research, planning, and regulation. A brief overview of the development of Federal water quality law is given below.

1948 Act

Before 1948, Federal law relating to water pollution was applied only to the specific concerns of navigation, disease, and oil discharges in the territorial sea and other tidal navigable waters. It is interesting to note, however, that one early law, the Refuse Act of 1899, was later used as a water pollution abatement instrument, particularly in the years 1970–72.

The 1948 act recognized the primary rights and responsibilities of the States in water pollution control, and this position is still the congressional policy in present law. The initial act provided for comprehensive water pollution control programs, research, financial assistance to States, municipalities, and interstate agencies for waste treatment facilities. Also included was a program of construction loans and preliminary planning grants that were never implemented because the funds were not appropriated. The act authorized abatement of interstate pollution of interstate waters through Federal court suits after two notifications to the discharger and a public hearing. The requirement that the offending State consent to the suit inhibited effective enforcement. Only one hearing was held and no suits were brought. The act's 5-year authorizations were extended for another 3 years to 1956, when the first permanent law was enacted.

1956 Act

Provisions of the 1956 act are outlined below; the law

- gave impetus to municipal waste treatment by authorizing Federal construction grants;
- strengthened the research function of the law including research grants, fellowships, and technical training;
- authorized the collection and dissemination of basic water quality data;
- authorized grants for the establishment and maintenance of adequate State water pollution control programs;
- continued the authority for comprehensive programs, technical assistance, and interstate cooperation; and
- established a three-step enforcement procedure (a Federal-State conference, a public hearing, and Federal court suit) in the case of interstate pollution of interstate waters endangering the health or welfare of persons. (State consent to a suit in such a case was not required.)

1961 Amendments

In 1961, the enforcement authority was extended to navigable as well as interstate waters and was applied to cases of the intrastate pollution of such waters on request of a governor. Further, the term "interstate waters" was redefined to include coastal waters. These steps greatly expanded the scope of the law. The authorization for construction grants for waste treatment works was increased and extended, the dollar ceiling was increased, and a higher ceiling was fixed for joint projects as an incentive to inter-community cooperation. Research was stepped up and regional laboratories were authorized. The program grant authorization was increased and extended. The use of water storage in Federal reservoirs for low-flow aug-

[p. 1]

mentation to improve water quality was fixed in law, but not as a substitute for adequate treatment or other waste control at the source.

1965 Amendments

The 1965 law provided for the establishment, revision, and enforcement of water quality standards for the Nation's interstate waters. The standards, consisting of water quality criteria, were designed to provide water of proper quality for a range of designated uses. A plan of implementation and enforcement was to be prepared in conjunction with the standards. The States

were given the first opportunity to adopt standard subject to Federal approval. Research and demonstration projects addressed to the difficult problem of storm sewer and combined storm-sanitary sewer wastes were authorized. Additional grant funds for waste treatment works were authorized under conditions that were beneficial to populous areas and conducive to State participation in project financing. A 10-percent increase in the amount of a grant was authorized for projects conforming with comprehensive metropolitan area plans. In certain cases of pollution injurious to the shellfish industry, the amendments authorized enforcement action on Federal initiative, whether or not the pollution was interstate in effect. The organizational placement of the national program was elevated with the creation of the Federal Water Pollution Control Administration (the agency was transferred from HEW to Interior in 1966, and its functions were transferred to EPA in 1970).

1966 Amendments

The principal thrust of the 1966 act was the expansion and redirection of the grant program for construction of waste treatment works. It was extended for 4 years, with authorizations increasing from $450 million in fiscal year 1968 to $1.25 billion in fiscal year 1971. (Appropriations in the first 2 years, particularly, fell far short of the authorization, however.) Dollar ceilings were removed, and the maximum Federal share of the project cost was raised from 30 to 40 percent if the State contributed 30 percent, and to 50 percent if the State contributed 25 percent and if enforceable water quality standards were estab- authorized for larger communities and more populous States. or local funds (up to the full Federal share) from future Federal fund allotments was authorized if adequate Federal funds were not currently available. Proportionately more funds were authorized for larger communities and more populous States. Grants to develop basin water pollution abatement plans were authorized; State program grant assistance was increased; and research and demonstration grants were authorized in the areas of advanced waste treatment and water purification, joint municipal-industrial treatment, and pollution by industry. Also, a study of pollution in the Nation's estuaries and special studies on costs, manpower, watercraft pollution, and incentives to industry for pollution control were directed. Authority was provided in an enforcement conference to request an alleged polluter to file a report on the character and quantity of his dis-

charges and on the measures being taken to prevent or reduce them. Authority was provided to require such information in a hearing.

1970 Amendments

The 1970 law repealed the Oil Pollution Act of 1924 (originally an Army Corps of Engineers authority vested in 1966 in the Secretary of the Interior) and added strong oil pollution control provisions to the basic Federal Water Pollution Control Act. EPA enforcement responsibilities in the implementation of this authority are described in Chapter V, *Federal Enforcement.* The removal of hazardous substances other than oil was provided, but, pending a study and report to Congress, no liability or penalty provisions as in the case of oil. Sewage from watercraft, mine drainage, lake euthrophication, Great Lakes pollution, manpower requirements, and pesticides were aspects of the total pollution problem addressed in the 1970 law. An important provision added to the basic act was that before a Federal licensing or permitting agency could issue a Federal license or permit, it had to be provided with State (or in some cases Federal) certification that applicable water quality standards would not be violated. Regulations governing marine sanitation devices promulgated under the watercraft pollution authority would preempt State and local regulation, but a State could seek a prohibition of any sewage discharge from a vessel. The oil pollution control provisions expressly preserved the right of States

[p. 2]

and localities to impose any requirement or liability.

1972 Amendments

The most extensive and far-reaching amendments to the Federal Water Pollution Control Act were those enacted in 1972. They reflect a concern for the Nation's waters and a strong commitment to end water pollution. They set the stage for a coordinated series of specific actions that must be taken—with strict deadlines and strong enforcement provisions—by Federal, State and local governments and by industries.

Some of the more important requirements organized by activity or area of concern are:

Industrial Pollution

- Industries must use "best practicable" water pollution control technology by mid-1977 and the "best available" by mid-1983.

- Discharges of toxic pollutants will be controlled by effluent standards to be issued by 1974.
- Industries must pre-treat effluents that are discharged into municipal treatment systems.

Municipal Pollution

- Federal construction grants up to $18 billion are authorized over the next three years to help local governments build needed sewage treatment facilities.
- An additional $2.75 billion is authorized to reimburse local governments for treatment plants constructed earlier in anticipation of Federal grants.

[p. 3]

- The Federal share of treatment facilities costs is increased to 75 percent (the maximum Federal share was 55 percent under previous legislation). An Environmental Financing Authority is established to help State and local governments raise their share of the cost of treatment facilities.
- Secondary treatment will be required for plants approved for construction before mid-1974; "best practicable" treatment will be required for plants approved thereafter.
- Treatment plants must provide a minimum of secondary treatment by mid-1977 and for plants under construction by mid-1978.
- All plants must apply and higher treatment necessary to meet water quality standards by mid-1977.
- All treatment plants will have to use "best practicable" treatment by mid-1983.
- Areawide waste treatment management plans shall be established by mid-1976 in areas with substantial water pollution problems.

Nonpoint Source Pollution

- EPA is required to develop information on (1) the nature and extent of nonpoint sources of pollution and (2) means to control such pollution from a range of activities.
- States are required to (1) submit reports on nonpoint sources of pollution, and (2) recommend control programs.

Water Quality Standards

- States must adopt water quality standards for intrastate waters and submit them by April 1973 for EPA approval. EPA is required to set standards if the States fail to do so.
- EPA is required to submit a report to Congress by 1974 on the quality of the Nation's waters.
- The States are required to submit to EPA and the Congress similar reports on waters within their borders by 1975.

[p. 4]

- A national surveillance system to monitor water quality will be established by EPA in cooperation with other Federal agencies and State and local governments.

Permits and Licenses

- The 1899 Refuse Act permit program is replaced by a new permit system which requires that no discharge of any pollutants from any point source.
- Publicly-owned treatment works, certain other municipally controlled discharge points, and commercial, agricultural and industrial dischargers must obtain permits.

Enforcement

- The 1972 law supplanted the former enforcement mechanisms with authority to enforce permit conditions and other requirements of the law through court action or administrative orders. Civil and criminal penalties can be applied to dischargers who violate permits.
- EPA is provided emergency power to seek immediate court injunctions to stop pollution. That represents an imminent or substantial danger to health or welfare.
- Dischargers may be required to keep proper records, install and use monitoring equipment, and sample their discharges.
- EPA is provided authority to enter and inspect any polluting facility.
- Any citizen or group of citizens whose interests may be adversely affected has the right to take court action against anyone alleged to be violating an effluent standard or limitation, or an order with respect thereto issued by EPA

or a State; or against the Administrator for his alleged failure to perform a nondiscretionary act or duty.

Some of the specific requirements of the Act and progress made toward their implementation are discussed in the following chapters of this report.

[p. 5]

II. WATER QUALITY PLANNING AND SURVEILLANCE

The 1972 amendments to the Federal Water Pollution Control Act obligated the Environmental Protection Agency to undertake a comprehensive reassessment of its programs, policies, and general control strategies. Major attention has been given to the greatly expanded planning requirements stipulated by the legislation. Major attention has also been afforded the development of a more extensive and usable water quality surveillance system.

The Planning Approach

The 1972 amendments provide a combination of two basic methods to achieve national water quality goals: effluent limitations based on control technology, and effluent limitations based on water quality standards.

Through its water quality planning activities, EPA will implement a control strategy designed to delineate the alternative solutions for those areas in which pollution is most severe and in which significant population concentrations would benefit from clean water.

The varying severity and nature of the water pollution problem throughout the country has resulted in a control strategy that embraces the following precepts:

- Water pollution control must be directed toward those areas where the problem is most severe. Generally, these areas are coincident with areas of greatest population concentration; a cleanup will thus have an impact on large numbers of people.
- EPA develops the guidelines by which river reaches are assigned priority for cleanup, but actual delineation of the areas is a State responsibility. This process will increase both State participation in and responsibility for implementation of the Act.
- EPA will initially concentrate on the 1977 water quality goals established by the legislation (secondary treatment

of municipal discharges, best practicable control technology for industrial dischargers, and more stringent limitations where they are needed to meet water quality and treatment standards). But the 1977 goals will not be implemented so as to preclude meeting the more restrictive 1983 goals.

- Paramount in the planning process will be the establishment of a continuing process by which States set priorities for the complex control actions required by the law.
- EPA will emphasize the preservation of existing high qualtiy waters and, at the same time, the improvement of substandard ambient conditions to meet water quality standards.

Water Quality Planning functions are delineated in the new legislation under sections 303(e), 208, and 201; of these, 303(e) provides the overall framework for management of State efforts.

Statewide Water Quality Planning [Section 303(e)]

The statewide water quality planning required by Section 303(e) is designed to be the central management tool of the States in administering their water quality programs. The planning process will provide direction to resource expenditures through establishing priorities and schedules of action. It will also provide the goals and framework for construction grant planning and areawide planning required by sections 201 and 208. A prime objective of the process is to

[p. 7]

achieve maximum effectiveness in pollution control programs.

The planning requirements of several other sections of the Act will be achieved through the 303(e) planning process, including those concerning water quality inventories, protection and restoration of lakes, water quality surveillance, and costs of water quality programs.

Emphasis will be afforded basin planning which will (1) identify water quality problems and their relative severity, (2) direct the application and mix of program elements such as local planning, monitoring, permitting, and construction grants toward solution of these problems, (3) set the effluent limits for each discharge in the basins, and (4) provide the basis on which the States' water quality program plans under section 106 will be developed.

Basin plans will be either section 303(e) management plans covering basins where there are relatively few water quality

limited segments,[1] or more complex full plans for the smaller number of basins with many water quality limited segments where load allocations must be prepared for dischargers to meet water quality standards. Both kinds will be prepared by the States.

The general approach to be employed in preparing section 303(e) plans will entail the following steps:

- States will be required to classify all river segments as either water-quality limited or effluent-guidelines limited. An effluent-guidelines limited segment would meet water quality standards after application of the best practicable control technology for industry, and secondary treatment for municipal plants. All other segments would be classified as water-quality limited. States should submit the classification list as part of their initial response to to section 303(e) regulations.
- For water-quality limited segments for which adequate data is available to make load allocations, full plans should be prepared and submitted no later than June 30, 1973.
- For water-quality limited segments for which adequate data is not available to make load allocation, States should identify resources and time schedules for obtaining the necessary data and completing the required full plans.
- For effluent-guidelines limited segments, States should begin preparing 303(e) management plans.

The section 303(e) planning process provides that the level of planning for a basin is to be tailored to the complexity of the pollution problems in the area and to the information requirements for water quality decisions in that basin.

All plans are required to include:

- a display of in-stream water quality data to certify that segments are properly classified as water quality class or effluent limitation class,
- an assessment of needs for publicly owned treatment works,
- an inventory and ranking of individual dischargers, and
- schedules of compliance and effluent requirements for dischargers.

[1] Water quality limited segments are those portions of a basin where it is known that water quality does not meet applicable water quality standards, or which are not expected to meet such standards even after application of best practicable control technology for industries, or secondary treatment for municipalities.

In addition, plans for water quality class will include:

- an assessment of total maximum daily loads necessary to meet water quality standards,
- an assessment of whether effluent limitations established will achieve the needed reductions to achieve water quality standards, and
- an assessment of nonpoint-source pollution and needed control measures.

Areawide Waste Treatment Management Planning (Section 208)

Areawide waste treatment management (AWTM) planning will be accomplished primarily in metropolitan areas that have substantial water quality problems requiring treatment levels beyond secondary for municipal wastes and best practicable control technology for industrial

[p. 9]

wastes. The planning would be limited to areas where units of local government have agreed, or have indicated their intent, to operate a coordinated waste treatment management system. Generally, the Governors of the States involved will designate the AWTM areas and the planning agencies that will conduct the work. The planning will include description of the regulatory programs required to assure pretreatment of industrial and commercial wastes and to abate nonpoint source pollution.

Draft regulations covering designation of AWTM planning areas are being prepared and are scheduled for publication by May 1973. Preparation of guidelines covering AWTM planning procedures has been initiated with completion scheduled for June 1973.

Planning For Construction of Treatment Works (Section 201)

Approval of construction grants will be contingent, in part, on evidence that alternatives and least-cost solutions have been investigated, and that the projects will be consistent with plans to meet water quality standards and effluent limitations. The facilities planning involved will emphasize the cost-effective evaluation and the environmental assessment of alternatives. The alternative approaches to be considered are grouped into three broad categories: (1) treatment and discharge to receiving water, (2) treatment and resue, and (3) spray-irrigation or other land disposal. The most cost-effective solution to correct excessive infiltration of the sewer collection system will also be examined.

Through the facilities planning process, unnecessary expenditure of public funds is expected to be avoided.

Regulations covering grants for construction of treatment works are under preparation and are scheduled for publication by summer 1973. Supplemental guidelines covering facilities planning are scheduled to be published by July 1973.

The Federal role, in addition to preparing regulations and guidelines, will involve (1) the development of criteria for the construction grant priority list, (2) providing funds at the applicable rate for approved projects and (3) participating in the various stages of construction. Such participation will emphasize preapplication and design conferences, and the assessment of environmental impacts.

Water Quality Surveillance

Effective planning requires an adequate water quality data base. Under the strategy developed by EPA, the States will undertake intensive monitoring surveys as an integral part of their continuing planning processes. These surveys will provide the States with an understanding of their water quality problems, including data to describe cause and effect relations of pollution in each river basin. For section 303(e) plans these surveys will provide the basis for determining the effects of point and non-point sources of pollution on receiving water quality.

At the national level, the 1972 amendments provide for the establishment of a national water quality surveillance system. This network of stations will provide a baseline of data against which the effects of pollution control actions can be assessed.

One of the most frequent problems encountered in developing such a baseline is the difficulty of measuring localized concentrations of pollutants. The location and characteristics of these concentrations make monitoring more difficult and the interpretation of data more complex. With this problem in mind, EPA is developing a plan to establish permanent monitoring sites primarily located at points upstream and downstream of major concentrations of polluters. These sites will be part of the National Water Quality Surveillance System required by Section 104(a)(5), and will be operated in cooperation with the States and other Federal agencies.

Until the surveillance system is operative, data for national assessments will come form existing sites operated by States, EPA and other Federal agencies. Using data from such sites, EPA is preparing a report that will cover both local and wide-

spread pollution concentrations in selected major rivers of the nation.[1] The report is scheduled for completion in January 1974.

[p. 10]

Planning Problems and Status

Problems. Problems relating to implementation of the water quality planning requirements of the new legislation fall generally under the following categories:

- Structuring national programs to accommodate widely varying types and extent of pollution.
- Coordination with States and local entities.
- Coordination among affected EPA programs and with other interested Federal agencies.

Resolving implementation problems will require a continuing effort, since many of the problems are not susceptible to a single, easy solution. Therefore, continuing review, refinement, and reassessment will be vital to efficient program development. Provision has been made for such activities in both the regulations and the guidelines prepared by this agency.

Coordination is of prime concern since so many different types and levels of goverment are affected. Steps are being taken at both the headquarters and regional levels to assure coordination.

Status. Tables 1 and 2 display information on river basins. The basin categories will determine the type of planning that will be employed to help meet water quality objectives.

[1] Selected for analysis are the following basins: Missouri, Mississippi, Rio Grande, Yukon, Arkansas, Colorado, Columbia-Snake, Ohio-Allegheny, Red (Oklahoma-Arkansas), Brazos, Tennessee, Mobile-Alabama, Susquehanna, Willamette, Hudson-New York Harbor, Los Angeles Harbor, Chicago-Lake Michigan, Delaware, Detroit, San Francisco Bay-Sacramento River, Potomac, Boston Harbor. Data and other constraints may preclude inclusion of all of these basins in the forthcoming report.

TABLE 1

DISTRIBUTION OF POPULATION AND MAJOR INDUSTRIAL DISCHARGERS BY TYPE OF BASIN*

Type of basins	Number of basins	Population accounted for (%)	Number of major industrial dischargers	*Average number* of major industrial dischargers per basin
Critical†	89	65	1,590‡	18
Other	178	35	1,078**	7

*Does not include 24 nonpriority basins in Alaska, Hawaii and U.S. Territories.
†Basins where pollution is most severe and significant concentration of population would benefit from cleaner water.
‡Equals 60 percent of total major dischargers.
**Equals 40 percent of total major dischargers.

[p. 11]

TABLE 2
SYNOPSIS OF BASINS

Type of basin	Low in nonpoint-source pollution	High in nonpoint-source pollution	Total basins
Critical basins	79	10	89
Other basins:			
High pollution	—	18	18
Medium pollution	30	10	40
Low pollution	68	28	96
Uncategorized*	—	—	24
Total	177	66	267

*Basins located in Alaska, Hawaii, and U.S. Territories.

[p. 12]

III. WATER QUALITY RESEARCH

The search for new and improved solutions to old problems through research, development, and demonstration is an important element of EPA's overall water quality control program. In broad terms, these activities may be divided into three categories—processes and effects, control technology, and implementation analysis.

PROCESSES AND EFFECTS

Ecological Effects. Studies of ecological effects are directed primarily toward the development of criteria to be used in the setting of water quality standards. Such standards will cover fresh water, estuarine, and marine uses. Research results will also be used to develop predictive capabilites for short term and long term effects of pollutants on species, community structure, and total ecosystems. Current research is specifically directed toward (1) determining acceptable levels of pesticides and pesticide derivatives in freshwater, estuarine, and coastal waters, (2) determining the effects of organic chemicals, heavy metals, petroleum, and petroleum by-products on freshwater and marine life, and (3) determining the temperature and dissolved oxygen requirements for freshwater and marine life.

EPA has published a number of reports pertaining to ecological effects, including the *Water Quality Data Book:* Vol. I, *Organic Chemical Pollutants of Freshwater;* Vol. II, *Inorganic Chemical Pollutants of Freshwater;* Vol. III, *Effects of Chemicals on Aquatic Life;* and Vol. IV, *An Investigation into Recreational Water Quality.* Guidelines for pesticides will be published in early 1973, primarily for use by the States.

Research has shown that polychlorinated biphenyls (PCB's) have the highest cumulative effect in freshwater fish and invertebrate tissue of any organic chemical known. Because of this,

the safe concentration of PCB has been revised downward by one to two orders of magnitude in the latest revision of water quality criteria.

Studies have also determined that chlorine used to disinfect waste treatment plant effluents has great potential harm on aquatic life. As a result of this finding, an effort is underway to demonstrate alternative disinfection methods and dechlorination methods.

A research facility has been established that is capable of testing the sensitivity of adult salmon to water pollutants. Results thus far have shown that adult salmon are more sensitive to a large number of pollutants than are the young.

Health Effects. Major attention must be afforded health effects in the development of water quality standards. Accordingly, EPA has assigned priority attention to research activities in this problem area. Current research stresses the health effects of chemical and infectious contaminants in drinking and recreational water. During 1973 and 1974 emphasis will be placed on an assessment of the toxic effects of trace minerals in the environment.

Transport Processes. Research on transport processes involves the study of the routes, rates, and mechanisms of pollutant movement and transformation in surface and underground bodies of water. Knowledge of these factors aids in predicting the environmental consequences of discharging pollutants to bodies of water. Pollutants receiving research emphasis are persistent organics, heavy metals, and nutrients.

Research attention has also been directed toward the effects and methods of controlling thermal discharges. A thermal discharge report, required by the new water quality legislation, is scheduled for release by July 1973. Eight monographic reviews covering various aspects of the thermal problem will be made. In addition, EPA has requested selected Federal agencies [1] to contribute to the report.

[p. 13]

Measurements and Instrumentation. A broad range of research activities has been undertaken to develop water quality measurement techniques and instruments. The more significant research efforts are discussed briefly below:

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[1] Tennessee Valley Authority, National Science Foundation, Federal Power Commission, National Oceanographic and Atmospheric Administration, and Bureau of Sport Fisheries and Wildlife.

- Development of test procedures required in the promulgation of effluent guidelines under section 304(g) is underway. Thirty-eight methods have been completed and are ready for publication by reference in the *Federal Register*. Twenty-eight additional methods will be completed by March 15, 1973.
- A system for characterizing the organic components of municipal and industrial wastes has been developed. Work is in progress to establish "fingerprints" for each constituent in the wastes.
- A chemical indicator of fecal pollution to rapidly detect contamination of potable water has been developed. This method is superior to earlier microbiological techniques, as it is independent of nutrient concentration in the water and is not subject to falsification by other sources of microorganisms.
- A device has been developed for extracting and concentrating viruses from water at very low concentrations. The concentrate can be shipped from the field to central laboratories for subsequent analysis. The lack of this capability has been the major deterrent to large scale surveys of water sources for viral contamination.
- An instrument capable of detecting the highly toxic organophosphorous pesticides at a level of one part per billion has been developed.
- A fluorescent antibody technique, which is rapid and specific, has been developed for the detection of streptococci bacteria.

Water Supply. Much of the research in the water supply area is directed toward improving the quality of drinking water as opposed to the prevention or control of water pollution. Current work includes studies on diseases associated with water-based recreation. For example, several projects are underway to qualify the measurement of bacterial pathogens and indicators in bathing waters. Useful results were obtained in salmonella-coliform ratios to support current criteria for body-contact-recreation water standards.

A test method has been developed that allows a reduction from 4 days to 7 hours in the time required to complete a coliform test. This will provide for one-shift control at water-treatment plants or bathing beaches.

Control Technology

Research, development, and demonstration programs are necessary to establish a technological base for the implementation of water quality objectives. Initially, emphasis will be placed on municipal, industrial, and other point sources of water pollution. Later, as the point sources of pollution are brought under broadened control programs, emphasis will shift to research of nonpoint sources.

Municipal. Conventional wastewater treatment, still in use in most localities, was developed over a period of years to remove suspended solids, biodegradable organics, and to some degree, microorganisms. The efficiencies of these treatment processes are generally below today's requirements. In addition, the characteristics of the wastewater to be treated have changed considerably because of the increasing amounts of industrial waste in municipal sewage. Therefore, new and improved treatment processes and process combinations are required.

Improved treatment processes in practice today which are to a large extent the result of EPA's research, development, and demonstration efforts, include processes that reduce the suspended solids, microorganism, and biodegradable organics content of municipal wastewater to very low levels. Processes are also available to reduce nutrient materials such as phosphorus and nitrogen, refractory organics, some heavy metals, and viruses to low levels. Improvement in operational reliability and process control through the use of better electronic sensing devices and computers is being made.

Collection and transport system technology has also been upgraded. Means of exercising control of flow in collection systems have been developed and demonstrated. Thus, it is possible to store or route flows to prevent system overflows and to equalize flow to treatment works. High-rate methods for treating overflows from combined sewers have been developed. Separation of sewers is no longer considered necessary or desirable in all cases for

[p. 15]

the control of pollution from combined sewer overflows, as equivalent control can be achieved at lesser cost.

Future work in the municipal technology area will include refinement of several of the newer unit processes to achieve bet-

ter cost effectiveness and to improve process reliability. Additional emphasis will be placed on cost effectiveness factors of treatment processes. New efforts will be initiated toward developing the ability to reduce sewage flow. These efforts will include work in the area of infiltration control.

Systems developing joint liquid and solid waste transport and treatment will be investigated. The current minimal efforts in developing improved technology for collection and treatment of rural sewage will be upgraded. Sludge treatment and its ultimate disposal is an area of great concern, and additional work will be conducted in sludge processing and alternative treatment techniques.

A total collection-transport-treatment concept will be emphasized in EPA's approach to research, development, and demonstration programs.

Industrial. The industrial pollution control program, which emphasizes innovative, efficient, and economical technology, is focused on (1) recycling and resource recovery, (2) integrating facilities to jointly meet other environmental problems such as solid waste and waste heat, and (3) facilities that produce alternative resources such as power or heat. The technology is structured toward recovery of some or all of the costs of control through sale of control byproducts and resources. The research efforts, in addition to demonstrating technological capabilities, will also contain an assessment of the direct costs of the facilities and benefits such as cost savings arising from byproduct recovery, more efficient production processes, and water recycling.

Joint industrial-municipal projects are planned that will demonstrate comprehensive and alternative approaches to regional waste management and/or treatment. They will be developed during the period 1973–76 with States and other public institutional water management authorities.

Requirements for industrial wastewater will be established by the formulation of industrial guidelines. Research for the guidelines will cover the character of the industries, their wastes, and the best practical and best available pollution control technologies currently employed. Research will also establish the pretreatment requirements for industrial discharges to public systems and identify the limits of toxic industrial pollutants for discharge to public treatment systems and receiving bodies of water.

EPA will expand treatment and control research of new methods and processes for the abatement of thermal pollution.

Nonpoint Sources. Nonpoint sources of water pollution is another problem area in which major research, development, and demonstration effects will be applied. The efforts will be directed primarily toward obtaining information on the nature and means of controlling pollution from agricultural, mining, construction, and forestry activities, and to control and abate pollution from oil and hazardous materials spills.

Implementation Research

Implementation research, based primarily on economic and systems analyses, assists EPA in meeting its environmental protection responsibilities. The research includes: (1) development of improved techniques for quantification of economic benefits and damages related to various levels of water pollution, (2) development of improved methods for setting and implementing both ambient and emission water quality standards, (3) development of procedures to assist EPA in responding to the National Environmental Policy Act, (4) exploration of fiscal and other alternatives to the regulatory process for achievement of environmental goals, and (5) a search for optimal water quality management concepts.

Completed economic analysis projects include assessment of the benefits of improving the quality of a recreational lake, a compilation of available current water pollution cost and benefit functions, a study of the effect of water pollution on land values, and a bibliography of water pollution costs literature containing nearly 2,000 entries.

Concerning environmental standards, the following projects were completed: (1) analysis of the feasibility of a strict interpretation of "zero-discharge" standards for water pollution, (2) exploration of the desirability of applying environmental quality standards on a combined air-water-solid waste basis, (3) an assessment of

[p. 16]

the use of reliability criteria in setting water quality standards, and (4) development of quantitative procedures for designing water quality standards surveillance systems.

Systems evaluation projects completed include an assessment of land use controls for protecting water quality, demonstration of water quality enforcement information systems, development of procedures for comprehensive management of phosphate pollution on an areawide basis, investigation of the air and solid waste pollution problems associated with water pollution con-

trol, a demonstration of regional water quality planning in a rural area, and development of procedures for analyzing cost effectiveness of water quality monitoring systems.

In response to the 1972 amendments, a project was initiated to determine and document the most effective benefit analysis techniques and practicable costs currently available for environmental analysis.

A study was begun to analyze the impact of the availability of water and sewer services on land development in the Lake Tahoe Basin. A related project, conducted in cooperation with the Council on Environmental Quality, considers the sewers-development question is a more general sense. Further study on this topic will investigate the use of environmental impact analyses of water supply and wastewater facilities in regional development decisions.

Projects were started on regional analysis of ambient and effluent standards, design of optimal effluent monitoring systems, and air-water-solid waste impacts of strict ocean disposal standards. Also, projects have been initiated (1) comparing the cost effectiveness of stormwater pollution control versus sewage treatment in a metropolitan area, (2) exploring new financing methods for pollution control equipment, (3) identifying the economic factors related to the potential reuse of used lubricating oils, and (4) investigating the use of crop insurance to decrease the demand for pesticides.

Research results are made available to all interested parties, particularly government authorities charged with water quality control at the Federal, interstate, State, regional, and local level.

[p. 17]

IV. DEVELOPMENT OF INDUSTRIAL EFFLUENT LIMITATIONS

Industries discharge into our Nation's waters a broad range of pollutants. In the aggregate, they form the largest and most toxic of all concentrated sources of pollution. On the average, industry discharges about three times the amount of waste that is discharged by all the sewered private residences in the United States, and the volume is increasing several times as fast as that of sanitary sewage.

The 1972 amendments provide for a vigorous attack on industrial water pollution, with set deadlines for a number of specific control actions. Guiding the control program will be two salient requirements: (1) existing industries discharging pollutants into the Nation's waters must use the best practicable water pollution

control technology currently available by July 1, 1977; and (2) they must employ the best available technology by July 1, 1983.

EPA will publish effluent limitations and guidelines to define the "best practicable" and "best available" technologies for various industries, by October, 1973. The guidelines can be adjusted for several factors, including the cost of pollution control, the age of the industrial facility, the process used, and the environmental impact (other than water quality) of the controls. EPA will also identify where possible pollution control measures for completely eliminating industrial discharges.

After May 1974 new sources of industrial pollution must use the best available demonstrated control technology which will be defined by EPA in the form of standards of performance for various industries. Where practicable, EPA may require that there be no discharge of pollutants from new industrial facilities.

Review of the legislation reveals that most of the required industrial pollution control activities are closely interrelated. Because of the close relationship, these activities are being performed simultaneously for each industry that is to be studied.

Contracts are being negotiated with responsible contractors to perform the necessary studies and analyses of the 27 industrial categories listed in section 306 of the FWPC Act. A tabulation of the industrial categories together with an estimation of the number of dischargers involved is shown in Table 1. The legislation directs that additional categories be identified and added to the mandatory listing already provided by Congress. Eighteen additional categories have already been identified as having substantial impact on critical river basins (Table 2), and 16 more categories (Table 3) have been identified for remaining industries. Both lists will be expanded as work progresses in identifying permit applicants and as pretreatment and cost recovery requirements are implemented.

Guideline Development

In the development of effluent limitations and guidelines it is the intention of EPA to obtain technical input and obtain critical review comments from other Federal agencies, the States, industry, citizen groups, and the Effluent Standards and Water Quality Information Advisory Committee. Public hearings will be held as indicated. The steps required to develop effluent limitations and guidelines for existing sources of industrial pollution, and performance standards for new sources of such pollution are outlined as follows:

- *Industrial categorization.* A preliminary listing of industries by categories has been developed. Industries are to be subcategorized based on raw material used, product produced, manufacturing processes employed, and other factors.
- *Waste characterization.* Raw waste characteristics for each category and/or subcategory must be identified. A waste and wastewater material balance is performed,

[p. 19]

indicating the source, flow, and volume of water and wastewaters. Constituents (including thermal) and the chemical, physical, and biological characteristics of all wastewaters (including toxic and other constituents causing taste, odor, and color effects) are identified.

- *Identification, documentation and verification of control and treatment technology.*

  This step includes consideration of the following items:
  —In-plant control techniques
  —All existing and potential treatment and control technologies (including in-plant and end-of-process technologies)
  —Limitations and reliability of each treatment technology and required implementation time
  —Effects of application of each treatment technology on other pollution problems
  —Resulting solid wastes and solid waste control technologies
  —Intake structure technology
- *Development of cost information.* For each treatment technology cost information must be developed for investment costs and annual costs (including capital costs, depreciation, operating and maintenance costs, and energy and power costs).

[p. 20]

- *Evaluation of data.* Data will be evaluated to determine the best practicable control technology currently available (Level I), the best available technology economically achievable (Level II), and the best available demonstrated control technology (Level III).

The effluent limitations and guidelines for existing sources and performance standards for new sources of pollution are being

developed for the 27 industrial categories (listed in Table 1) in accordance with the steps outlined above. These categories will be formally identified by publication in the *Federal Register* by February 1973.

TABLE 1
MAJOR INDUSTRIAL CATEGORIES LISTED IN FWPC ACT

Category	Permit applications	Major dischargers
1. Pulp and paper mills	404	306
2. Paperboard, builders paper and board mills		
3. Meat product and rendering processing	307	19
4. Dairy product processing	301	10
5. Grain mills	71	16
6. Canned and preserved fruits and vegetables processing	308	46
7. Canned and preserved seafood processing	456	98
8. Sugar processing	137	143
9. Textile mills	550	14
10. Cement manufacturing	100	0
11. Feedlots	24	0
12. Electroplating	472	125
13. Organic chemicals manufacturing	276	112
14. Inorganic chemicals manufacturing	214	102
15. Plastic and synthetic materials manufacturing	174	35
16. Soap and detergent manufacturing	54	14
17. Fertilizer and phosphate manufacturing	480	52
18. Petroleum refining	193	130
19. Iron and steel manufacturing	328	111
20. Nonferrous metals manufacturing	278	32
21. Steam electric powerplants	2,619	357
22. Ferroalloy manufacturing	48	13
23. Leather tanning and finishing	338	31
24. Glass manufacturing	132	17
25. Asbestos manufacturing	43	12
26. Rubber processing	306	27
27. Timber products processing	402	32
Total	9,015	1,854

[p. 21]

TABLE 2
ADDITIONAL INDUSTRIAL CATEGORIES WITH IMPACT IN CRITICAL RIVER BASINS

Ranking*	Category	Permit applications	Major dischargers	Major dischargers in critical river basins
1	Coal mining	798	31	23
2	Water supply	898	28	16
3	Motor vehicles	317	19	12
4	Nonferrous metal forming	210	30	12
5	Nonelectrical machinery	276	16	11
6	Misc. food and beverage	422	60	24
7	Petroleum and gas	1,031	28	9
8	Fish hatcheries and fish farming	309	19	—
9	Electrical machinery	333	26	10
10	Limestone	392	10	4
11	Misc. mineral products	152	11	4
12	Metal mining	403	54	6
13	Misc. chemicals	320	71	10
14	Fabricated metal products	337	11	4
15	Sand and gravel	397	22	2
16	Railroads	326	8	1
17	Paving and roofing materials	129	8	5
18	Steam supply	17	1	1
	Total	6,662	453	174

* This ranking is based upon impacts within critical basins.

[p. 22]

TABLE 3
REMAINING INDUSTRIAL CATEGORIES IDENTIFIED AS SIGNIFICANT

Category	Permit applications	Major dischargers	Major dischargers in critical river basins
1. Misc. plastic products	164	4	0
2. Auto and other laundries	185	0	0
3. Natural gas liquids	157	1	0
4. Converted paper products	124	27	0
5. Chemical and fertilizer mining	57	13	0
6. Petroleum products, wholesale	449	1	0
7. Public warehousing	152	0	0
8. Airports	60	5	0
9. Groceries	65	0	0
10. Printing	64	1	0
11. R&D laboratories	53	0	0
12. Marine cargo handling	46	0	0
13. Sanitary services	42	9	0
14. Gasoline service stations	29	0	0
15. Hospitals	28	0	0
16. Miscellaneous*	1,470		
Total	3,145	61	0

* Includes a number of permit applications that are not classified at this time.

[p. 23]

V. FEDERAL ENFORCEMENT

Federal Enforcement Procedures Before The 1972 Amendments (October 18, 1972)

Before the 1972 amendments, the FWPC Act provided for (1) the abatement of pollution of interstate or navigable waters endangering the health or welfare of persons, and (2) the abatement of pollution lowering the quality of interstate waters below the water quality standards established under the Act.

The first authority, provided in 1956 and expanded by subsequent enactments, set out a three-step enforcement procedure—conference, public hearing, and court action. The succeeding step was taken if satisfactory progress toward abatement was not attained at the preceding step. A conference could be called either at state request, in a case of interstate or intrastate pollution, or initiated by EPA, in a case of interstate pollution. The EPA Administrator could initiate a conference in certain cases of pollution resulting in economic injury to shellfish producers, whether or not the pollution of interstate or navigable waters was interstate in effect. The conferees (representing EPA, the States, and any interstate water quality agency) convened to review the existing situation and any progress made, to lay a basis for future action for all parties concerned, and to give the States, localities, and industries an opportunity to take any indicated remedial action under State and local law.

The second authority, provided in 1965, permitted court action against a discharger alleged to be in violation of water quality

standards after expiration of a 180-day notice period. The legislative history of the 1965 enactment directed that an informal hearing be held at the request of a State, the alleged violator, or other interested party so that voluntary agreement could be reached if possible during the 180-day period, thus eliminating the necessity for suit. EPA regulations provided for an informal hearing in any case of a water quality standards violation notice.

The FWPC Act was amended in 1970 to provide for the abatement of pollution by oil in navigable waters, on adjoining shorelines, and in the Contiguous Zone. EPA has shared responsibilities in such abatement with the Coast Guard and other Federal agencies. Federal enforcement may be taken in these cases:

- Failure to notify of harmful discharge (criminal penalty)
- Knowing harmful discharge (civil penalty)
- Vessel in marine disaster (removal or destruction, cost recovery)
- Imminent and substantial threat, onshore or offshore facility (court relief)
- Recovery of cleanup cost
- Violation of removal and prevention regulations (civil penalty)

EPA was made responsible for enforcement in the case of an imminent and substantial threat to the public health or welfare because of an actual or threatened discharge of oil into or upon navigable waters from an onshore or offshore facility. Further, EPA was assigned responsibility for (1) the assessment of civil penalties in cases of violations of removal regulations in inland waters and prevention regulations with respect to nontransportation related onshore and offshore facilities, and (2) for the support of the Coast Guard in its enforcement responsibilities.

The Refuse Act, section 13 of the River and Harbor Act of 1899, prohibits the discharge of refuse (except that flowing from streets and sewers and passing from them in a liquid state) into navigable waters without a permit or in violation of the conditions of a permit. The Act was administered for many years by the Army Corps of Engineers, primarily in the interest of navigation. Although court decisions had supported the Act's use in water pollution abate-

ment cases, it was not until 1970 that it became a viable water pollution enforcement mechanism. The Act does not expressly provide for injunctive relief, but the Supreme Court has ruled that the Federal Government may obtain injunctions under the Act. Generally, EPA has not recommended criminal prosecutions under the Refuse Act other than in cases of isolated or instantaneous discharges resulting in serious damage. A civil remedy has generally been more effective in preventing future pollution.

The Refuse Act Permit Program, established under Executive Order 11574, December 23, 1970, took effect July 1, 1971. The program required that all discharges or deposits into navigable waters or their tributaries, or into waste treatment systems other than municipal systems from which the matter will flow into navigable waters or their tributaries, should be made only in compliance with the conditions of a permit issued by the Army Corps of Engineers. EPA was responsible for determinations with respect to water quality aspects of the permit. The participation of the States in the program was provided for by Section 21(b) of the FWPCA, as amended in 1970, which required State certification that a proposed discharge would not violate water quality standards before a permit could be issued. If the State denied certification, no permit could be issued; EPA could, however, recommend denial of a permit even though the State had granted certification.

Under the Refuse Act, EPA regions received applications through the Corps of Engineers district offices and determined what requirements were necessary to prevent violations of water quality standards. The Corps incorporated into the permits consideration of effects on navigation and the opinions of the Department of the Interior's Bureau of Sport Fisheries and Wildlife and opinions of the Department of Commerce's National Oceanographic Atmospheric Administration. In anticipation of permit issuance, the Corps gave public notice (sometimes jointly with the State), allowed 30 days for comment, and where indicated, held a public hearing. The Corps was also responsible for such administrative decisions as whether or not to give confidential status to information supplied on the application form. The failure to make timely application for a Refuse Act permit under the program became cause for enforcement action.

To maximize the impact of the program on water quality, EPA developed a systematic approach to the job. Major dischargers (that is, the relatively small number of facilities which contribute about 85 percent of the Nation's total pollution load) were identi-

fied for early attention, as were high priority basins. A major task was the development by headquarters of guidance on achievable effluent limits for 22 different industrial categories for use by the regions as a basis for setting uniform requirements for similar facilities throughout the country. Certain conditions that would be standard to all permits were also developed. Two sophisticated computer systems were put into use to record, manipulate, and retrieve the vast amount of data that is reported on permit applications.

Of the 20,000 applications that were received, very few were complete enough to be processed. As a result, only about 25 permits had been issued by December 1971, at which time a court injunction blocked further issuance. A Federal court decision in the *Kalur* case, December 21, 1971, enjoined the granting of permits under the program until the Army Corps of Engineers amended its permit regulations to require environmental impact statements as specified by the National Environmental Policy Act. The court also held that no permits whatever could be issued for discharges into nonnavigable tributaries of navigable waters. A further legal obstacle was created by the decision of the Third Circuit Court of Appeals in the *PICCO* case, May 30, 1972, that the company could not be held criminally responsible for discharges under the Refuse Act until a permit system was in operation. These legal difficulties were removed with respect to future cases by the FWPCA Amendments of 1972. Preparation of permit requirements continued, however, in anticipation of new enabling legislation.

Enforcement Procedures Under the 1972 Amendments

The 1972 amendments confer major new regulatory authorities on EPA. Following is a description of the most significant procedures.

Enforcement (Section 309). Whenever the Administrator finds that any person is in violation of any condition or limitation in a State-issued National Pollutant Discharge Elimination System (NPDES) permit which implements

[p. 27]

Sec. 301 (effluent limitations),

Sec. 302 (water quality related effluent limitations),

Sec. 306 (national standards of performance for new sources),

Sec. 307 (toxic and/or pretreatment effluent standards), or

Sec. 308 (inspection, monitoring, and/or entry requirements), he is directed:

- To issue an order requiring compliance, which must state with reasonable specificity the nature of the violation and specify a reasonable time for compliance (not to exceed 30 days), taking into account the seriousness of the violation and any good faith efforts to comply (with copy of order to States involved, and opportunity for alleged violator to confer with Administrator in case of section 308 violation); or
- To bring a civil action for appropriate relief, including a permanent or temporary injunction, in the United States district court in which the defendant is located or resides or is doing business, which court shall have jurisdiction to restrain the violation and to require compliance (with immediate notice of the commencement of the action to appropriate State); or
- To notify the alleged violator and the State, and if the State has not commenced appropriate enforcement action after 30 days, to issue a compliance order; or
- To bring a civil action.

The Administrator is directed to give notice to a State whenever he finds that permit violations are so widespread as to appear to result from a failure of State enforcement; and if the failure extends beyond 30 days, he is directed to enforce any permit within the State through compliance order or civil action. The period of Federally assumed enforcement begins with the public notice and ends when the State satisfies the Administrator that it will enforce the permits.

The Administrator is further directed, whenever he finds that any person is in violation of sec. 301, 302, 306, 307, or 308, or of any condition or limitation in an EPA-issued or a State-issued permit implementing any of those sections, to issue a compliance order, or to bring a civil action.

Penalties. The willful or negligent violation of sections 301, 302, 306, 307, or 308, or any condition or limitation in an EPA-issued or State-issued permit implementing any of those sections is punishable by a fine of not less than $2,500 nor more than $25,000 a day, or by imprisonment for not more than 1 year, or by both, with a $50,000 fine or 2 years' imprisonment or both the maximum penalty for a second conviction.

Knowingly making a false statement in a document filed or required to be maintained under the Act, or tampering with a

monitoring device, is punishable by a fine of not more than $10,000, by imprisonment for not more than 6 months, or by both.

The violation of sections 301, 302, 306, 307, or 308, of an implementing permit condition or limitation, and the violation of any compliance order issued by the Administrator, is subject to a civil penalty not to exceed $10,000 a day.

Oil and Hazardous Substance Liability (Section 311). The provisions of former Section 11 are retained largely unchanged in Section 311 of the amended Act. Hazardous substances, to be designated in EPA regulations, are made subject to the same provisions. Substances determined to be not removable are liable for money penalties.

National Pollutant Discharge Elimination System (Section 402). The provisions of this section gave the permit authority to EPA with the Corps of Engineers still responsible for evaluating effects on anchorage and navigation. The new permit program includes additional discharges in its jurisdiction—for example, municipal treatment facilities, commercial establishments, and additional agricultural activities. General farming operations, discharges to municipal treatment facilities, and a limited number of other very specific discharges are still exempt from the program. Standardized application and discharge reporting forms have been prepared for each type of discharger, requiring reporting of the minimum data elements necessary for thorough evaluation of the discharge.

The States will play a much greater role in the NPDES. Those having adequate permit programs can apply for and receive either interim authority or final approval from EPA to issue the

[p. 28]

permits. After extensive coordination with the States, EPA prepared guidelines describing the elements that are necessary in a State program in order to receive the permit authority. EPA maintains the power to veto permits if an affected State objects to the issuance of the permit, or if the Administrator finds that it would be outside the law's guidelines and requirements, and to retract the program approval if a State fails to maintain the conditions of approval. While NPDES permits will also prohibit violation of water quality standards, the new emphasis is on compliance with the effluent requirements. Effluent guidance for industrial categories developed in connection with the Refuse Act permit program will be applied, where appropriate, in the issuance of NPDES permits. Pretreatment standards will be set

for industries discharging to municipal treatment facilities, and these facilities themselves will be regulated by a formal definition of secondary treatment. Permits will be issued for a maximum of 5 years and will be conditioned to bring the discharger to the scheduled levels of water quality required by the Act.

Emergency Powers (Section 504). The Administrator is authorized to bring suit on behalf of the United States in the appropriate district court in the event of pollution which presents an imminent and substantial endangerment to the health of persons, or to the welfare of persons if the pollution endangers their livelihood (such as inability to market shellfish). The Administrator's suit in such a case may be to immediately restrain any person causing or contributing to such pollution to stop the polluting discharge or to take other necessary action.

Appearance (Section 506). The Administrator shall request the Attorney General to appear in civil or criminal actions. EPA attorneys shall represent the United States in civil actions if the Attorney General does not notify the Administrator within a reasonable time that he (the Attorney General) will appear.

Federal Facilities (Section 313). Federal agencies must comply with Federal, State, interstate and local pollution control and abatement requirements, to the same extent that any person is subject to such requirements. Since similar provisions were included in the Clean Air Act Amendments of 1970 and the Noise Control Act of 1972, a multipollutant compliance system for Federal facilities is being analyzed for feasibility.

EPA Enforcement Actions. The following table summarizes enforcement actions taken under the authorities available to EPA immediately prior to the enactment of the Federal Water Pollution Control Act Amendments of 1972. In this first annual report, we include as of possible interest to the Congress actions initiated since EPA's establishment in December 1970, and actions taken under the Refuse Act, as well as the Federal Water Pollution Control Act, inasmuch as the former statute was extensively used in water pollution abatement during the period. Appendixes A-F list the dischargers involved in actions taken under the several authorities and give additional information on the cases.

[p. 29]

TABLE 1
SUMMARY OF WATER ENFORCEMENT ACTIONS
PURSUED BY EPA DECEMBER 2, 1970—SEPTEMBER 30, 1972

Enforcement Actions Under the Federal Water Pollution Control Act		245*
Water Quality Standards Violation Notices (180-Day Notices) Served—(See Appendix A)	171	
Enforcement Conference-type Actions—(See Appendix B)	50	
Water quality standards-setting conference	1	
New enforcement conferences	8	
Reconvenings, additional and progress evaluation sessions of conferences	19	
Approvals of conference abatement recommendations and remedial programs	22	
Referrals to Justice Department for Prosecution Under Section 11 (Oil Pollution)—(See Appendix C)	24	
Enforcement Actions Under the Refuse Act of 1899		323
Civil Actions Referred to Justice Department by EPA Headquarters and Regional Offices (Appendix D)	97	
Criminal Actions Referred to Justice Department by EPA Headquarters and Regional Offices (Appendix E)	143	
Non-filing of Section 13 Permit Application Cases Referred to Justice Department by EPA (Appendix F)	83	
Total water enforcement actions		568

* Excludes 4 additional referrals to Justice Department on expiration of the 180-day notice period.

[p. 30]

VI. STATE AND LOCAL WATER POLLUTION CONTROL PROGRAMS

The primary rights and responsibilities of the States in water pollution control are explicitly recognized in the Federal Water Pollution Control Act. To assist the States in exercising these rights and responsibilities, EPA provides a broad range of program activities, including financial and technical assistance, research, planning and regulation. The status of State programs, Federal assistance provided, and a discussion of the role of the States in water pollution control are presented below.

State Program Grants For Fiscal Year 1972

Federal authorizations for State water pollution control program grants have grown from $3 million for FY1957 to $15 million for FY1972. The grants are based on annual State program submissions, which are evaluated to determine (1) their consistency and compatibility with regional and national water policies and objectives and (2) the feasibility of achieving expected results taking into consideration implementation problems. The grants are used to support many State and interstate programs, including those dealing with permits, municipal facilities, operation and maintenance, planning, enforcement, monitoring, training, water quality standards, research and development and administration.

The Federal and State funds allocated for pollution control pro-

grams for FY1972 are presented by program element as follows (in millions): [1]

Planning and water quality criteria	$ 8.2
Water pollution control facilities	11.6
Other programs	4.6
Surveillance	14.0
Enforcement	5.9
Executive and auxiliary	7.4
Total	51.7

The expenditures for these program elements are summarized in Table 1 by States. The summary shows that the States, on an average, expended nearly 3 dollars of State funds for each dollar received through Federal assistance.

State Activities Changed in FY1972. The major areas of expansion and/or change by State agencies were in the areas of surveillance, planning, water pollution control facilities, and other programs (certification, training, feedlots, mine drainage, oil field brine, etc.). Table 2 indicates program changes by State.

The major changes in planning and water pollution control facilities were associated with metropolitan/Basin plans, and with the national permit system. Changes in other programs involved mainly the mandatory certification of waste treatment plant operators and the training of qualified operators in methods of water quality control. Surveillance included an expansion in quanlity and quantity of monitoring equipment and laboratory facilities.

Areas Where EPA Assistance was Needed to Complement and Support State Activities and Goals. The States in their annual program submissions listed the areas where Federal assistance was most needed. Table 3 indicates that research and development, planning, and other programs were the major areas needing assistance in FY1972. These requests reflect both financial and technical needs.

[p. 31]

[1] These funds were supplemented during fiscal year 1972 by $5 million in Federal funds, and $1.8 million in additional State and local funds, raising the total to $58.5 million. (See Table 1 for breakdown by States.)

TABLE 1
FY 1972 EXPENDITURES—WATER QUALITY PROGRAMS*

	Federal	State	Total
Region I			
Connecticut	$251,250	$453,731	$704,981
Maine	95,500	521,512	616,912
Massachusetts	401,700	1,132,363	1,534,063
New Hampshire	97,350	555,535	652,885
Rhode Island	163,200	219,100	382,300
Vermont	66,300	339,989	406,289
NEIWPCC†	132,450	134,900	267,350
Region II			
New Jersey	468,300	912,936	1,381,236
New York	968,100	4,665,269	5,633,369
Puerto Rico	288,750	144,000	432,750
Vir. Islands	109,800	36,600	146,400
I.S.C.‡	207,450	241,615	449,065
Region III			
Delaware	129,000	238,300	367,300
Dist. of Col.	130,200	388,224	518,424
Maryland	275,850	1,793,990	2,069,840
Penna.	734,100	2,731,000	3,465,100
Virginia	312,600	1,178,490	1,491,090
West Virginia	161,400	530,631	692,031
D.R.B.C.**	200,250	487,354	687,604
INCOPOT††	76,800	94,728	171,528
Region IV			
Alabama	277,350	158,750	436,100
Florida	415,200	836,603	1,251,803
Georgia	320,700	675,200	995,900
Kentucky	246,000	344,950	590,950
Mississippi	205,800	173,852	379,652
N. Carolina	387,600	614,778	1,002,378
S. Carolina	226,500	468,629	695,129
Tennessee	306,450	778,100	1,084,550
Region V			
Illinois	646,350	1,791,248	2,437,598
Indiana	350,700	535,024	885,724
Michigan	540,150	1,556,895	2,097,045
Minnesota	237,000	1,385,002	1,622,002
Ohio	671,700	1,085,041	1,756,741
Wisconsin	299,250	1,709,800	2,009,050
ORSANCO††	283,050	198,400	481,450
Region VI			
Arkansas	168,900	345,500	514,400
Louisiana	269,400	428,641	698,041
New Mexico	79,650	183,814	263,464
Oklahoma	177,000	263,710	440,710
Texas	636,900	3,668,346	4,305,246
Region VII			
Iowa	184,950	170,400	355,350
Kansas	143,850	478,100	621,950
Missouri	296,100	249,972	546,072
Nebraska	101,550	173,023	274,573
Region VIII			
Colorado	136,350	341,415	477,765
Montana	59,250	195,381	254,631
North Dakota	56,100	31,100	87,200
South Dakota	58,350	58,014	116,364
Wyoming	36,300	47,800	84,100
Utah	84,150	136,714	220,864
Region IX			
Arizona	115,200	81,310	196,510
California	1,008,000	4,934,000	5,942,000
Guam	111,450	65,505	176,955
Hawaii	103,500	330,900	434,400
Nevada	38,250	36,200	74,450

TABLE 1 (Continued)

Region X	Federal	State	Total
Alaska	30,600	127,900	158,500
Idaho	65,850	216,552	282,402
Oregon	148,350	649,585	797,935
Washington	205,950	1,157,700	1,363,650
Total	$15,000,000***	$43,484,121†††	$58,484,121

*Does not include expenditures for construction of waste water treatment facilities.
†New England Interstate Water Pollution Control Commission.
‡Interstate Sanitation Commission (New York, New Jersey, Connecticut).
**Delaware River Basin Commission.
††Interstate Compact for the Potomac River Basin.
‡‡Ohio River Valley Water Sanitation Commission.
***26 percent of total expenditures.
†††74 percent of total expenditures.

Man-years Assigned to Water Pollution Control. Total man-years assigned to water pollution control by the States for FY1972 are as follows:

Planning and water quality criteria	496.45
Water pollution control facilities	833.98
Other programs	260.62
Surveillance	972.50
Enforcement	432.58
Executive and auxillary	450.23
Total	3,446.36

Reported manpower allocations have increased by 87 percent during the period from FY1968 through FY1972. The bulk of the increase has been in activities related to water pollution control facilities and surveillance.

Municipal Waste Water Treatment Works Grants for FY1972

National attention has been focused on the expanding need for municipal waste treatment facilities since enactment of the first permanent Federal Water Pollution Control Act in 1956. That Act initiated the program to provide Federal grant assistance to communities to

[p. 33]

improve or construct sewage treatment facilities. Subsequent amendments have helped accelerate plant construction by making more money available on a more liberal basis.[1]

Since 1957, the Federal government has provided $5.3 billion for construction and expansion of more than 13,700 municipal waste treatment projects. These funds have assisted States and

[1] See Chapter I for evolution of the grant program.

TABLE 2
PROGRAM AREAS IN WHICH ACTIVITIES WERE CHANGED DURING FY 1972, BY STATE

State	Planning	Water quality criteria	Water pollution control facilities	Other programs*	Surveil-lance	Enforce-ment	Research and develop-ment
Alabama	X						
Alaska	X					X	
Arizona	X		X		X	X	
Arkansas	X		X		X		
California	X	X		X	X		
Colorado	X	X	X		X		
Connecticut		X	X				
Delaware	X	X	X	X			
District of Columbia				X	X	X	X
Florida		X		X		X	
Georgia	X		X		X		
Hawaii		X	X	X			
Idaho	X	X		X	X		
Illinois	X	X	X	X			
Indiana		X		X	X	X	
Iowa					X	X	
Kansas	X			X			
Kentucky	X			X	X		
Louisiana	X	X	X				
Maine						X	
Maryland			X	X			
Massachusetts	X		X		X	X	
Michigan		X	X	X	X		
Minnesota	X		X		X		
Mississippi				X	X	X	
Missouri			X	X	X	X	
Montana			X	X		X	
Nebraska			X	X	X		X
Nevada	X		X				
New Hampshire	X		X	X	X		
New Jersey	X			X	X	X	
New Mexico			X		X		
New York				X			
North Carolina	X		X	X	X		
North Dakota		X	X	X	X	X	
Ohio		X			X		X
Oklahoma	X			X	X		
Oregon		X		X	X		
Pennsylvania	X	X	X			X	X
Rhode Island			X	X	X		
South Carolina					X		
South Dakota	X	X	X		X	X	
Tennessee				X			
Texas		X			X	X	
Utah	X	X	X	X	X	X	
Vermont			X				
Virginia	X				X		
Washington				X			
West Virginia	X	X	X	X		X	
Wisconsin	X	X	X	X	X	X	
Wyoming	X			X	X		
Guam	X		X	X			
Puerto Rico	X			X	X		
Virgin Islands			X	X			
Total	30	20	30	33	33	19	4

*Includes programs such as those concerned with certification, training, feedlot pollution and mine drainage.

communities in the construction of $14.5 billion of treatment works. In the construction of these works the States and communities spent nearly 2 dollars for each dollar received in Federal assistance. Table 4 summarizes the Federal expenditures for these plants, by fiscal year, from 1957 through 1972. The table shows that more funds have been obligated in the last 2 years than were obligated in the preceding 14 years.

[p. 35]

TABLE 3
PROGRAM AREAS WHERE EPA ASSISTANCE WAS NEEDED IN FY 1972 TO COMPLEMENT AND SUPPORT ACTIVITIES AND GOALS

State	Planning	Water quality criteria	Water pollution control facilities	Other programs*	Surveil-lance	Enforce-ment	Research and develop-ment
Alabama	X				X		
Alaska					X		X
Arizona		X	X				
Arkansas							
California			X	X			X
Colorado	X			X			
Connecticut			X	X			X
Delaware				X			X
District of Columbia				X			
Florida	X			X	X	X	X
Georgia				X			X
Hawaii				X			
Idaho	X			X			X
Illinois				X			
Indiana				X		X	
Iowa				X			
Kansas				X			
Kentucky	X			X			
Louisiana	X			X			
Maine					X	X	
Maryland			X				
Massachusetts							
Michigan				X	X		
Minnesota				X		X	
Mississippi				X			
Missouri				X			
Montana				X			X
Nebraska	X			X	X		
Nevada	X		X	X			X
New Hampshire			X				
New Jersey			X	X			
New Mexico							
New York				X			
North Carolina				X			
							[p. 36]
North Dakota			X				X
Ohio					X		X
Oklahoma	X	X		X	X		
Oregon			X	X			X
Pennsylvania	X		X	X	X		X
Rhode Island				X			X
South Carolina	X			X			
South Dakota	X			X			
Tennessee				X	X		X
Texas	X		X				X
Utah	X		X	X			X
Vermont							
Virginia	X		X	X			X
Washington				X			
West Virginia	X		X	X			
Wisconsin	X	X	X	X			
Wyoming	X	X	X	X	X	X	X
Guam				X			
Puerto Rico	X			X			X
Virgin Islands				X	X		
Total	19	4	16	41	12	5	20

*Includes programs such as those concerned with certifiration, training, feedlot pollution and mine drainage.

The 1972 amendments have greatly expanded the Federal role in financing construction of municipal waste water facilities: The Federal share has been increased from a maximum of 55 percent to 75 percent; Federal grants up to $18 billion are authorized over the next three years; and an additional $2.75 billion is authorized to reimburse local governments for treatment plants constructed earlier in anticipation of Federal grants.

State allocations and obligations for FY1972 construction grant funds are listed in Table 5. The table shows that as of December 31, 1972, virtually all of the $2 billion appropriated had been obligated.

Role of The States

EPA recognizes the primary rights and responsibilities of the States in water pollution control. Below are listed the more important activities to be performed by the States in carrying out their responsibilities.

Planning and Monitoring. States are responsible for section 303(e) statewide water quality

[p. 37]

TABLE 4
MUNICIPAL WASTE WATER TREATMENT WORKS CONSTRUCTION GRANTS ANNUAL AUTHORIZATIONS, APPROPRIATIONS, OBLIGATIONS & EXPENDITURES

Fiscal year	Authorized appropriation	Actual appropriation	Fiscal year obligations	Expenditures*
1957	$ 50.000,000	$ 50,000 000	$ 50,000,000	$ 844,000
1958	50,000,000	45,657,000†	45,657,000	16,884,000
1959	50,000,000	46,816,000†	46,816,000	36,429,000
1960	50,000,000	46,101,000†	46,101,000	40,295,000
1961	50,000,000	45,645,260†	45,645,260	44,085,000
1962	80,000,000	80,000,000	80,000,000	42,103,000
1963	90,000,000	90,000,000	90,000,000	51,738,000
1964	100,000,000	90,000,000	89,642,425	66,432,000
1965	100,000,000	90,000,000	88,225,123	69,755,000
1966	150.000,000	121,000,000	120,946 373	81,479,000
1967	150.000,000	150,000 000	150,000,000	84,476,000
1968	450,000,000	203,000,000	203,000,000	122,109,000
1969	700,000,000	214,000,000	214,000,000	134,530,000
1970	1,000,000,000	800,000,000	800,000,000	176,377,000
1971	1,250,000,000	1,000,000,000	997.000,000‡	478,366,000
1972	2,000,000,000	2,000,000,000	2,000,000,000‡	413,407,888
Total	6,320,000,000	5,072,219,260	5,067,033,181	1,859,309,888

*Payments during fiscal year period.
†Includes supplemental requests and appropriations of $657,000 in 1958, $1,816,000 in 1959, $1,101,000 in 1960 and 645,260 in 1961.
‡Estimated to nearest million dollars.

TABLE 5
MUNICIPAL WASTE WATER TREATMENT WORKS CONSTRUCTION GRANTS
SUMMARY OF UTILIZATION OF FISCAL YEAR 1972 APPROPRIATED FUNDS AS OF DECEMBER 31, 1972

State	Allocations	Obligations
Alabama	$ 33,785,150	$ 33,785,150
Alaska	3,548,000	3,548,000
Arizona	17,695,750	17,695,750
Arkansas	19,418,050	19,418,050
California	189,541,250	189,541,250
Colorado	21,738,150	21,738,150
Connecticut	29,350,500	29,350,500
Delaware	5,921,650	5,921,650
District of Columbia	7,800,150	7,800,150
Florida	65,134,450	65,134,450

[p. 38]

Georgia	44,438,400	44,438,400
Hawaii	8,074,300	8,074,300
Idaho	7,074,300	7,781,900
Illinois	105,887,000	105,887,000
Indiana	49,976,950	48,169,170

TABLE 5 (Continued)

State	Allocations	Obligations
Iowa	27,588,850	27,588,850
Kansas	22,146,850	22,146,850
Kentucky	31,538,750	31,538,750
Louisiana	35,551,850	35,551,850
Maine	10,403,050	10,403,050
Maryland	37,871,250	37,871,250
Massachusetts	54,569,050	54,569,050
Michigan	84,756,550	84,756,550
Minnesota	36,850,650	36,850,650
Mississippi	22,346,700	22,346,700
Missouri	45,134,550	45,134,550
Montana	7,534,600	7,534,600
Nebraska	14,898,500	14,898,438
Nevada	5,326,250	5,326,250
New Hampshire	7,846,750	7,846,750
New Jersey	68,549,450	68 549,450
New Mexico	10,670,500	10,670,500
New York	172,839,550	172,839,550
North Carolina	49,155,750	49,155,750
North Dakota	6,876,100	6,874,568
Ohio	101,621,800	101,621,800
Oklahoma	25,212,500	25,212,500
Oregon	20,638,000	20,638,000
Pennsylvania	112,444,900	112,444,900
Rhode Island	9,770,100	9,770,100
South Carolina	25,694,050	25,694,050
South Dakota	7,308,800	7,308,796
Tennessee	38,227,450	38,227,450
Texas	106,900,250	106,900,250
Utah	11,030,650	11,030,639
Vermont	5,137,200	5,137,200
Virginia	44,914,250	44,914,250
Washington	33,037,650	33,037,650
West Virginia	17,657,050	17,657,050
Wisconsin	42,646,650	42,499,350
Wyoming	4,049,450	4,042,922
Guam	2,172,000	2,172,000
Puerto Rico	27,032,550	27,032,550
Virgin Islands	1,957,500	1,957,500
Total	$2,000,000,000	$1,998,036,783

[p. 39]

planning.[1] In this planning they classify water body segments as either water-quality limited or effluent-guidelines limited. On water-quality-limited segments, they make load allocations, prepare section 303(e) full plans, and perform monitoring and analysis where required. On effluent-guidelines-limited segments they prepare section 303(e) management plans.

The States are also responsible for reviewing the development of section 208 areawide waste treatment management plans by local agencies. State review is to ensure adequacy, completeness, and compatibility with the overall process developed to implement the Federal Water Pollution Control Act.

States prepare an annual report that describes (1) the interim goals to be achieved during the year (based on past progress and the ultimate goals of their section 303(e) plans), (2) the State resources to be assigned in meeting the goals, and (3) the method of assigning resources. These reports help EPA set pro-

[1] See Chapter II for greater detail.

gram priorities, and allocate financial and other assistance to the States.

Permits. The effluent discharge permit program will be transferred to the greatest extent possible to State authorities. Where transfer does not occur, EPA, while issuing the permits, will

[p. 40]

engage in a cooperative program with the States to mutually prepare permit conditions, supported by any State analyses performed under section 303(e) statewide planning.

Municipal Programs. States have responsibility for developing their construction grants priority lists. In exercising this responsibility, through review of plans and specifications for treatment works, the role of the States will be enhanced. Primary responsibility for seeing that treatment plants operate correctly also belongs to the State.

Enforcement. States share responsibility with the Federal Government for enforcement. The Federal role is a backup role—where States cannot maintain an adequate enforcement level, the Federal Government will ensure enforcement.

Nonpoint Sources. Nonpoint-source pollution control is basically a State responsibility. States are responsible for the planning, development and implementation of appropriate control strategies. In the development of such strategies, it is expected that the States will consider the special relation of nonpoint-source pollution to lake eutrophication. In those areas where deep-well disposal is practiced, States will be expected to develop disposal control programs.

[p. 41]

VII. EFFICIENCY OF TREATMENT WORKS

The 1972 amendments authorize $18 billion over the 3 fiscal years ending mid-1975 to help local governments build sewage treatment plants. In order that the planners of such plants may benefit from the performance of existing facilities, EPA conducts annual surveys of plant efficiencies. The surveys, required by Section 210, take into consideration the planned as well as the actual efficiency of plant operations and maintenance.

Procedures For Accomplishment

The ongoing EPA operation and maintenance (O&M) program includes an operational compliance inspection effort on all projects assisted by Federal grants. The inspections are accom-

plished by EPA regional staff engineers or State regulatory agency engineers. Currently, inspections are conducted near the end of the first year of new plant operation, but the initial efforts 4 years ago included a sizeable number of older plants.

The results of these inspections for the last 4 years are contained in a computer file, Sewage Treatment Plant Operation and Maintenance Data Base (STPOM), which has been the basic data source used in developing information for the O&M efficiency survey. The STPOM data file contains operational data, but insufficient design data, on approximately 1,400 grant-funded plants.

The file was searched and a selection made of plants with operating data usable for the purposes of the efficiency survey. Of the 1,400 plant data files examined, 470 were found to have insufficient operational data to permit the desired efficiency comparisons and were deleted from the survey. These included primarily smaller plants, which have reported little or no operational performance testing. The remaining 930 projects were referred to the 10 EPA regional offices for development of original design data. Additional projects were deleted during this phase, as described later under "Problems." The final group of projects was examined by coding operation data, design data, and other information into a computer. Various printouts were obtained in the development of the comparisons and in analyzing problem areas. Results of the analyses are presented below.

Data Analysis

Plants Analyzed. Records of approximately 1,400 plants (10 percent of all grant-funded plants) were examined, but only 48 percent contained sufficient information to accomplish an analysis. Comparisons were made on a sample of some 670 plants, distributed throughout the nation, that included all sizes and types. Table 1 is a display of the sample by size groupings and by type of principal process.

Efficiency Compared to Design. Operational data for conducting the efficiency comparison were taken from plant operational records at the time of the EPA or State inspection (conducted some time between 1968 and 1972, inclusive). The data included the annual average percentage removal of biological oxygen demand (BOD_5), suspended solids and settleable solids, and the average flow for the 12-month period preceding the inspection. These values were directly compared with those determined to be applicable to the original design.

The principal results of the survey can be summarized as follows:

- Compared to original design cirteria
  - —67 percent of all plants surveyed were meeting the original design criteria for removal of BOD_5
  - —55 percent were meeting design criteria for suspended solids removal
  - —70 percent were meeting design criteria for settleable solids removal
- For those plants not meeting design criteria, the average deviation below design

[p. 43]

TABLE 1
NUMBER OF PLANTS ANALYZED, BY SIZE AND PRINCIPAL PROCESS

Principal process	Group 1 (15+ mgd*)	Group 2 (5-14.99 mgd)	Group 3 (1-4.99 mgd)	Group 4 (0-0.99 mgd)	Total
Primary	10	13	30	42	95
Lagoons	---	2	4	42	48
Trickling filter	4	19	98	119	240
Activated sludge	6	20	57	204	287
Total	20	54	189	407	670

*Million gallons per day.

[p. 44]

was nine percentage points of BOD_5 removal.

- For those plants meeting or exceeding design criteria, the average deviation above design was six percentage points of BOD_5 removal.
- For all plants, the average actual removals were:

BOD_5	79%
Suspended solids	77%
Settleable solids	96%

Table 2 shows the number of plants that do and do not meet design criteria for BOD_5 removal, by size and principal process. The deviation below design is shown for those plants that do not meet design. The table shows that a higher percentage of small plants than large plants is meeting design criteria. Such a conclusion should be moderated by an appreciation of the fact that laboratory test data for small plants are normally accomplished with less expertise and at a lesser sampling and analysis frequency than for large plants. Table 2 also indicates a striking

uniformity of deviation of those plants not meeting design, regardless of size or type.

Average Removal Efficiencies. The average removal efficiencies for each process type and size grouping are shown in Table 3. The average design values are also shown for comparison.

This survey has determined that 33 percent of the individual plants examined are not meeting their design efficiency in terms of BOD_5 removal. Table 3 shows, however, that the average actual percent of BOD_5 removal for all plants slightly exceeds the average design values. This is not true for suspended solids. In fact, in the case of lagoons, there is an average deviation of 14 percentage points below average design values for suspended solids removal.

Plant Problems. The survey revealed that in

[p. 45]

the plants that do not meet design, certain problems could be identified:

- 20 percent were hydraulically overloaded.
- 40 percent were affected by infiltration problems during wet weather.
- 14 percent had a structural problem.
- 41 percent had a temporary mechanical failure.
- 49 percent had an operational problem(improper operation and/or need to upgrade training of operators).
- 24 percent were found to provide inadequate laboratory testing.
- 17 percent were rated fair or poor in the area of general maintenance.

Of those plants not meeting design, it was reported that 44 percent were faced with pending action by the State regulatory agency. In a similar EPA survey a year ago, a recheck determined that within 1 year of inspection, 25 percent of the deficiencies had been corrected through follow-up actions of State agencies or EPA regional offices.

General Problems

Deficiencies in Plant Sampling and Laboratory Analysis. As previously mentioned, some 470 inspection data files did not include sufficient operational data to accomplish the desired efficiency comparison and were deleted from the survey. The principal reason for lack of operational data was the failure of some plants

[p. 46]

TABLE 2

NUMBER OF PLANTS MEETING DESIGN CRITERIA FOR BOD_5 VS. NUMBER OF PLANTS NOT MEETING DESIGN

[Based on BOD_5 Removals]

Type of process	Group 1 (15+ mgd*)				Group 2 (5-14.99 mgd)				Group 3 (1-4.99 mgd)				Group 4 (0-0.99 mgd)				All groups			
	Meeting		Not meeting		Meeting		Not meeting		Meeting		Not meeting		Meeting		Not meeting		Meeting		Not meeting	
	No.	%	No.	Deviation†	No.	%	No.	Deviation†	No.	%	No.	Deviation†	No.	%	No.	Deviation†	No.	%	No.	Deviation†
Primary	5	50	5	13	6	46	7	9	20	67	10	10	27	64	15	11	58	61	37	11
Lagoons	---	---	---	---	1	50	1	5	2	50	2	8	31	74	11	9	34	71	14	8
Trickling filter	4	100	--	---	7	37	12	8	57	58	41	9	75	63	44	9	143	60	97	9
Activated sludge	2	33	4	4	13	65	7	8	43	75	14	8	153	75	51	10	211	73	76	9
Total/average	11	55	9	9	27	50	27	8	122	65	67	9	286	70	121	9	446	67	224	9

*Million gallons per day.
†Equals average deviation below design, in percentage points of BOD_5 removal.

TABLE 3

AVERAGE PERCENT REMOVAL (ACTUAL)

	Type of process														
	Primary			Lagoons			Trickling filter			Activated sludge			All plants		
	BOD_5	Suspended solids	Settleable solids	BOD_5	Suspended solids	Settleable solids	BOD_5	Suspended solids	Settleable solids	BOD_5	Suspended solids	Settleable solids	BOD_5	Suspended solids	Settleable solids
Group 1 (15+ mgd*)	35	58	96	—	—	—	94	91	97	87	80	83	62	71	93
Group 2 (5-14.99 mgd)	33	60	93	84	75	—	83	82	93	89	87	96	73	78	94
Group 3 (1.0-4.99 mgd)	41	59	98	84	76	99	83	78	95	88	84	96	78	76	96
Group 4 (0.0-0.99 mgd)	39	62	95	85	68	90	84	81	97	89	84	96	82	79	96
Average removals (%)	38	60	96	96	85	70	83	80	96	89	84	96	79	77	96
Average design values	36	55	95	93	83	84	84	83	98	87	87	98	78	80	97

*Million gallons per day

to conduct sampling and laboratory testing. This failure was largely restricted to the smaller plants of less than 1 million gallons per day capacity. The operators of such plants may have been unduly influenced by a guidance manual issued in 1963 which suggested that only settleable solids tests be conducted for small plants. Also, the FY 1972 *EPA Digest of State Programs* shows that 10 States do not require monthly reporting of operating results, a fact that quite likely affects the degree of sampling and testing performed in those States. In a few cases, the survey used data from grab samples tested by State agencies in the absence of routine testing by the plant staff.

Within the limited time available to conduct this survey, it was not possible to confirm the accuracy or validity of the plant operational data. It was necessary to use the operational data already available in the computer file from the grant compliance inspection program. As a result, the figures cited for the small plants of less than 1 million gallons per day capacity, may be based on very limited analytical data (in some cases, only one grab sample). For the larger plants, however, the data base is generally much better and there is good assurance that the information presented represents actual conditions for the plants inspected.

Availability of Design Criteria. As previously stated, a listing of 930 projects from the STPOM file were referred to EPA regional offices for determination of original design criteria. The design criteria were not available for a number of plants for the following reasons:

- For many years, it has been a fairly common practice to design municipal wastewater plants on the basis of the type of process utilized (standard rate trickling filter, conventional activated sludge, extended aeration, etc.). To each of these processes a general range of annual average removal efficiencies was ascribed. There was no definable single numerical value by which plant performance could be measured. Only very recently have design engineers begun to identify design intent in specific terms (presumably in response to 40 CFR 35.835–4, June 9, 1972, which requires a minimum removal of 85 percent of BOD_5).
- The limited time available for this study, and other constraints, precluded a search of State files of each project to secure the original design criteria. The search was restricted to data currently available within the 10 EPA

regional offices. Where original design criteria was available for a specific plant, that data has been used. For those projects for which data retrieval was not feasible, an evaluation of applicable State requirements was made. If a clearly identifiable State requirement for design efficiencies existed at the time of original approval, then those criteria were used.

Status

Deficiencies in Plant Sampling and Laboratory Analysis. There are several actions currently underway by EPA in the implementation of the 1972 amendments that will directly improve the sampling, testing, and reporting activities of plant operations. Regulations and guidelines in various stages of development will accomplish this through (1) elements of the National Pollutant Discharge Elimination System, (2) establishment of effluent limitations under section 301, (3) definition of the effluent reduction attainable by application of secondary treatment under section 304, (4) improved operation and maintenance functions within State program plans, and (5) grant eligibility requirements under Title II. The ongoing development of source documents by EPA for guidance in plant staffing, laboratory staffing, minimum sampling and testing procedures, and model State operation and maintenance programs will provide overall detailed information for improved operational control. The present computer file will be expanded to include data from an additional 1600 plants within 6 months.

Availability of Design Criteria. Steps have been taken to improve the availability of design data. Further, the FY1974 study effort will permit sufficient time to secure design data from additional sources to supplement existing regional files. Regulations and guidelines in various stages of promulgation or development will provide for the clear identification of intended design efficiencies in project submissions and reviews in the future.

Plant Problems. The general existence of the deficiencies reported has been known for some time and was the basis for organizing in 1968 operation and maintenance programs and staffs

[p. 47]

at headquarters and regional levels. Many of the program elements initiated then and since are just now beginning to have an impact on the problems through source documents, guidelines, and manuals. Program needs are being coordinated agency-

wide in a number of areas, including research, manpower development and training, State programs, and construction grants. Existing efforts will be expedited and enhanced greatly by regulations now being promulgated (as mandated by FWPC Act) covering permits, pretreatment standards, effluent limitations, state programs, and grant eligibility requirements. Increased sampling and reporting of operational efficiencies, more frequent inspections, more positive follow-up actions, upgrading of operational personnel and facilities, and higher standards nationally are expected to accomplish direct and lasting correction of the principal deficiencies now identified.

[p. 48]

VIII. MANPOWER PROGRAMS

The effectiveness of water quality control programs will be influenced to a major degree by the availability of skilled manpower. This manpower will be needed in the Federal, State, and private sectors of the economy and will involve skill levels that vary from complex professional specialties to simple manual operational tasks.

Because of the major changes in the national water pollution effort, the first manpower implementation activity that must be completed is a detailed analysis of the impact of the new legislative requirements on the national manpower pool. Such an analysis must identify both manpower shortages and skill deficiencies. The identified needs must then be assessed in terms of costs and feasibility of action.

In addition to a program for identifying specific needs, EPA has a series of manpower and training programs designed to affect the areas of identified deficiency. These programs are described below in summary fashion.

Manpower Planning

The existing manpower planning program is designed to develop the capability of Federal, State, and local agencies to determine and meet their manpower and training needs.

Accomplishments. Manpower planning capability has been established in more than 30 States. The Department of Labor has issued an interagency instruction encouraging the establishment of linkages between the water pollution control agency manpower planner and the manpower planning coordinating staffs in the offices of governors and mayors. The Office of Education is supporting the training of 200 manpower planners from Federal,

State, and local agencies in planning for wastewater treatment plants. Occupational definitions and staffing guides have been developed or are being developed for wastewater treatment plants, collection systems, and State agencies. A priority has been placed on improvement of operator certification practices of State agencies. EPA, with support of the American Water Works Association and the Water Pollution Control Federation, made the following accomplishments in this area: (1) a model State law was developed and promulgated by the Council of State Governments; (2) a national certification authority (Association of Boards of Certification) to promote improved and consistent certification practices among State agencies has been established; and (3) a body of guidelines for the administration of State certification programs was developed and issued. In cooperation with State agencies, professional and employer associations, and other EPA organizations, a series of manpower demand and supply studies has been completed, started, or planned to cover all sectors of the water pollution control program.

Manpower Training

Operator Training for Municipal Waste Treatment. The primary objective of this program is to foster an adequate supply of skilled manpower to properly operate, maintain, and monitor existing and future water and wastewater treatment facilities and collection systems. Operator training programs to provide additional personnel for new plants and to improve the effectiveness of operators in plants with operating deficiencies will be provided on the basis of priority basin needs.

Undergraduate Training (Section 109a and 110–112). The undergraduate training program is designed to prepare students for work relating to the design, operation, and maintenance of treatment plants and other related facilities. Curriculum development projects and pilot training programs have been implemented in a limited number of schools. Three schools [1] with 100

[p. 49]

trainees conduct 2-year training programs for plant operators, and the University of Wisconsin conducts a 4-year engineering design program for 20 trainees.

Direct Technical Training. EPA provides direct technical training to help meet the short term needs of Federal, State, or municipal agencies responsible for implementing the new water qual-

[1] Charles Country Community College (Maryland), Greenville Technical center (South Carolina), Linn-Benton Community College (Oregon).

ity legislation. Priority will be given to personnel with responsibilities for improving water quality in the 89 critical basin areas.

Professional Training. Demand for personnel in the professional category will continue to increase, primarily as a result of expanded construction grants, State planning and administration programs, and a broad range of research needs. The Agency's professional training grant program has been a source of funding for the preparation of advanced professionals entering the field of water quality management.

ESTIMATE OF MANPOWER NEEDS

Although special manpower planning studies must be completed before detailed estimates of the manpower implication of the 1972 amendments can be fully assessed, existing information provides a general measurement of possible need. The last national manpower estimate is summarized in Table 1. This estimate forecasts a large increase in manpower and training needs, but it can be considered conservative, since it does not consider the specific requirements of the new water quality legislation.

TABLE 1
ADDITIONAL MANPOWER REQUIRED BY 1976*

Personnel category	Sector					Total for 1976
	Nongovernment	Local	State	Federal (non-EPA)	EPA	
Professional	10,200	1,300	3,400	1,300	600	16,800
Operator	33,300	8,900	—	1,400	—	43,600
Technician	18,400	1,200	400	200	200	20,400
Other	10,400	11,700	800	400	600	23,900
Total	72,300	23,100	4,600	3,300	1,400	104,700

*Source: A Report to Congress on Water Pollution Control Manpower Development and Training Activities (Committee on Public Works Print 92-36 of March 1972).

[p. 50]

IX. WASTE POLLUTION CONTROL ADVISORY BOARD

A Water Pollution Control Advisory Board has served since enactment of the first Water Pollution Control Act in 1948. The Board under present law consists of the Administrator or his designee who serves as Chairman, and nine non-Federal members appointed by the President for 3-year terms. The Board consults with, advises, and makes recommendations to the Administrator on matters of policy relating to water pollution control. During 1972 the Board held three meetings and developed findings and recommendations on animal wastes, land use, and ocean disposal.

Animal Wastes

In late 1971 and early 1972, the Board undertook a review of problems relating to pollution of water resources by animal wastes. It toured agricultural areas in Colorado, Nebraska, Kansas, Illinois, and Indiana and conducted meetings to receive testimony from experts and interested citizens. In addition, the Board considered recommendations developed by a national symposium on animal waste management and by workshops conducted by several academic institutions. The Board's recommendations concerning animal wastes are presented in Appendix G.

Land Use

The Water Pollution Control Advisory Board met jointly with the Air Quality Advisory Board (15 members appointed by the President for 3 year terms) to review relationships between environmental quality and land use. The Board toured areas of California from Lake Tahoe to Los Angeles. The recommendations of the two Presidential advisory boards are presented in Appendix G.

Ocean Disposal

The Board met in New York City during September 1972 to explore and make recommendations on the subject of ocean disposal. Based on (1) briefing by representatives of Federal, State, and local agencies, (2) a flyover to view sewage sludge dumping, dredge spoil dumping, and acid waste dumping in the New York Bight, and (3) a day of public testimony, the Board developed recommendations which are presented in Appendix G.

[p. 51]

Appendix A

FEDERAL WATER POLLUTION CONTROL ACT WATER QUALITY STANDARDS VIOLATION NOTICES [1] (12-3-70/10-18-72)

Item	Date of Letter	Date of Informal Hearing
City of Atlanta, Ga. (Chattahoochee River)	12/9/70	1/12/71
City of Detroit, Mich. (Detroit River—Lake Erie)	12/9/70	2/1/71
City of Cleveland, O. (Lake Erie)	12/9/70	1/28/71
City of Chicopee, Mass. (Connecticut River)	4/9/71	6/2/71
Piels Brothers, Inc. Chicopee, Mass. (Connecticut River)	4/9/71	6/2/71
City of Pepperell, Mass. (Nashua River)	4/9/71	6/3/71
Bemis Company, Inc., East Pepperell, Mass. (Nashua River)	4/9/71	6/3/71
St. Regis Paper Company, East Pepperell, Mass. (Nashua River)	4/9/71	6/3/71
Reserve Mining Company,[2] Silver Bay, Minn. (Lake Superior)	4/28/71	6/3/71 [2]
Santa Fe Land Improvement Company, Kansas City, Kans. (Kansas River)	6/1/71	7/13/71
Holly Sugar Company, Torrington, Wyo. (North Platte River)	6/15/71	7/21/71
Ashland Oil and Refining Company, Ky. (Big Sandy River)	6/22/71	8/6/71 9/22/71 [3]
City of Stamford, Conn. (Long Island Sound)	7/16/71	9/3/71
Town of Darien, Conn. (Long Island Sound)	7/16/71	9/3/71
City of Bogalusa, La. (Bogue Lusa Creek/Pearl River)	7/21/71	9/9/71
City of Euclid, O. (Lake Erie/Euclid Creek)	7/30/71	9/9/71
City of Willoughby, O. (Lake Erie) (Eastlake Sewage Treatment Plt)	7/30/71	9/9/71
City of Eastlake, O. (Lake Erie) (Eastlake Sewage Treatment Plt)	7/30/71	9/9/71
Beachwood, O. (Cleveland Sewer System/Lake Erie)	8/9/71	9/24/71
Bratenahl, O.	8/9/71	9/24/71
Cleveland Heights, O.	8/9/71	9/24/71
East Cleveland, O.	8/9/71	9/24/71
Gates Mills, O.	8/9/71	9/24/71
Lyndhurst, O.	8/9/71	9/24/71
Mayfield Heights, O.	8/9/71	9/24/71
Richmond Heights, O.	8/9/71	9/24/71
South Euclid, O.	8/9/71	9/24/71
Lakewood, O.	8/9/71	9/24/71
Brooklyn, O.	8/9/71	9/24/71
Brook Park, O.	8/9/71	9/24/71
Garfield Heights, O.	8/9/71	9/24/71
Maple Heights, O.	8/9/71	9/24/71
Newburgh Heights, O.	8/9/71	9/24/71
Warrensville Township, O.	8/9/71	9/24/71
Highland Heights, O.	8/9/71	9/24/71
Mayfield Village, O.	8/9/71	9/24/71
Shaker Heights, O.	8/9/71	9/24/71
University Heights, O.	8/9/71	9/24/71
Bedford Heights, O.	8/9/71	9/24/71
Brooklyn Heights, O.	8/9/71	9/24/71
Cuyahoga Heights, O.	8/9/71	9/24/71
Linndale, O.	8/9/71	9/24/71

[1] 180-day notices under (former) Section 10 of the FWPC Act.
[2] As 180-day period did not result in an acceptable abatement plan, the U.S. Attorney was requested on 1/20/72 to prosecute in Federal Court; on 2/17/72, the Department of Justice filed suit for civil relief under the Refuse Act and under Section 10 of the FWPC Act (see Appendix D).
[3] Second hearing.

Item	Date of Letter	Date of Informal Hearing
Middleburg Heights, O.	8/9/71	9/24/71
North Randall, O.	8/9/71	9/24/71
Parma, O.	8/9/71	9/24/71
Seven Hills, O.	8/9/71	9/24/71
Parma Heights, O.	8/9/71	9/24/71
Warrensville Heights, O.	8/9/71	9/24/71
Franklin, N.H.	8/20/71	10/19/71
Vincennes, Ind. (Wabash River)	9/3/71	10/8/71
City of Hurley, Wis. (Montreal River)	9/30/71	11/18/71
City of Superior, Wis. (Lake Superior)	9/30/71	11/17/71
Superior Fiber Products Co., Superior, Wis. (Lake Superior)	9/30/71	11/17/71
City of Whiting, Ind. (Lake Michigan)[4]	10/12/71	12/1/71 [4]
City of Hammond, Ind. and Hammond Sanitary District (Lake Michigan, Grand Calumet River, Little Calumet River)	10/12/71	12/1/71
City of Dunkirk, N.Y. (Lake Erie)	10/22/71	12/1/71
City of Covington, Ind. (Wabash River)	11/3/71	1/5/72
City of Logansport, Ind. (Wabash River)	11/3/71	12/14/71
City of Montezuma, Ind. (Wabash River)	11/3/71	1/5/72
Tahoe-Douglas District, Nev.[5] (Lake Tahoe)	11/9/71	1/6/72 [5]
Kingsbury General Improvement District, Nev.[5] (Lake Tahoe)	11/9/71	1/6/72 [5]
Brown Paper Co., Castleton-on-Hudson, N.Y.	12/23/71	1/25/72
Patrician Paper Co., South Glens Falls, N.Y.	12/23/71	1/25/72
City of Las Vegas, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Clark County Sanitation District, Las Vegas, Nev. (Las Vegas Wash)	12/23/71	1/25/72
City of Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Nevada Power Co., Las Vegas, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Basic Management, Inc., Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Kerr-McGee Chemical Co., Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Stauffer Chemical Co., Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Montrose Chemical Co., Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
U.S. Lime Division, Flintkote Co., Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Titanium Metals Corp. of America, Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Jones Chemical Co., Inc., Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
State Stove & Manufacturing Co., Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Nevada Rock and Sand Co., Las Vegas, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Las Vegas Valley Water District, Las Vegas, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Alton Box Board Co., Lafayette, Ind. (Wabash River)	1/28/72	3/1/72
National Sugar Refining Co., Philadelphia, Pa. (Delaware River)	2/1/72	2/14/72; 2d mtg
Sun Olin Chemical Co., Claymont, Del. (Middle Creek)	2/1/72	2/9/72
Sun Oil Co., Marcus Hook, Pa. (Delaware River)	2/1/72	2/29/72
American Sugar Refining Co., Philadelphia, Pa. (Delaware River)	2/1/72	2/24/72
FMC Corp., American Viscose Div., Marcus Hook, Pa.[6] (Marcus Hook Creek)	2/1/72	2/14/72; 2d mtg on 2/29/72 [6]
GAF Corp., Gloucester City, N.J. (Delaware River)	2/9/72	3/22/72
City of Garland, Utah (Malad River)	2/11/72	3/7/72
City of Tremonton, Utah (Malad River)	2/11/72	3/7/72

[4] As 180-day period did not result in acceptable abatement plan, the U.S. Attorney was requested on 9/5/72 to prosecute in Federal Court under Section 10(g) of FWPCA.

[5] As 180-day period did not result in acceptable abatement plan, the U.S. Attorney was requested on 6/21/72 to prosecute in Federal Court under Section 10(g) of FWPCA.

[6] As 180-day period did not result in acceptable abatement plan, the U.S. Attorney was requested on 9/28/72 to bring civil suit under the Refuse Act.

Item	Date of Letter	Date of Informal Hearing
Great Western Sugar Co., Greeley, Colo. (Cache La Poudre Dr., trib. of So. Platte R.)	2/14/72	3/28/72
Great Western Sugar Co., Ovid, Colo. (So. Platte River)	2/14/72	3/29/72
Washington Suburban Sanitary Commission, Md. (Potomac R.—Wash., D.C. Metro Area)	2/24/72	3/17/72
Federal Paper Board Co., Inc., Riegel Products Div., Milford, N.J. (Delaware R.)	3/6/72	3/26/72
Hudson, S. Dak. (Big Sioux River)	3/17/72	4/18/72
Great Western Sugar Company, Nebr. 4 co. Plants (Along North Platte River) at Gering, Scottsbluff, Bayard & Mitchell, Nebr.	4/27/72	5/23/72
City of Sheboygan, Wis. (Fox River to Green Bay/Lake Michigan)	5/9/72	6/21/72
American Can Company, Green Bay Mill, Green Bay, Wis. (Fox River/Green Bay)	5/9/72	6/20/72
Charmin Paper Products Company, Fox River Mill, Green Bay, Wis. (Fox River/Green Bay)	5/9/72	6/20/72
Green Bay Metropolitan Sewerage District, Green Bay, Wis. (Fox River/Green Bay)	5/9/72	6/20/72
City of Montpelier, Ida. (Bear River)	5/17/72	6/13/72
City of Priest River, Ida. (Pend Oreille River)	5/17/72	7/11/72
City of Paul, Ida. (Tributary of Snake River)	5/17/72	7/5/72
City of Sandpoint, Ida. (Pend Oreille Lake)	5/17/72	6/10/72
New Orleans, La. (Mississippi River)	5/19/72	6/9/72
City of Lebanon, N.H. (Mascoma River—Tributary of Connecticut River)	6/1/72	6/29/72
E. Cummings Leather Company, Inc. Lebanon, N.H.	6/2/72	6/29/72
Yazoo City, Miss. (Yazoo River)	6/12/72	7/27/72
Natchez, Miss. (Mississippi River)	6/12/72	7/26/72
West Point, Ky. (Ohio River)	6/26/72	8/2/72
Crucible Steel Corporation, Geddes, N.Y. *(Tributary of 5A of Lake Onandaga)*	6/26/72	7/12/72
Henderson, Ky. (Ohio River)	6/26/72	8/1/72
W.R. Grace Company, Owensboro, Ky. (Ohio River)	6/29/72	8/1/72
New York City, N.Y. (New York Harbor & Adjacent Water)	7/18/72	

Item	Date of Letter	Date of Informal Hearing
Passaic Valley Sewerage Commission (Upper Bay of New York Harbor)	7/18/72	
Gary Sanitary District, Gary, Ind. (Grand Calumet River, Indiana Harbor Canal, Lake Michigan)	7/28/72	9/7/72
Alaska Ice & Storage, Inc., Alaska (Kodiak Harbor)	8/2/72	9/7/72
Alaska Packers Association, Alaska (Kodiak Harbor)	8/2/72	9/7/72
B & B Fisheries, Inc., Alaska (Kodiak Harbor)	8/2/72	9/7/72
Columbia Ward Fisheries, Alaska (Kodiak Harbor)	8/2/72	9/7/72
Eastpoint Seafood Company, Alaska (Kodiak Harbor)	8/2/72	9/7/72
King Crab, Inc., Alaska (Kodiak Harbor)	8/2/72	9/7/72
Kinnear & Wendt, Inc. (Kodiak Harbor)	8/2/72	9/7/72
New England Fish Co., Alaska Gibson Cove Plant (Kodiak Harbor)	8/2/72	9/7/72
New England Fish Co., Alaska Marine Way Plant (Kodiak Harbor)	8/2/72	9/7/72
Northers Processors, Alaska (Kodiak Harbor)	8/2/72	9/7/72
North Pacific Processors, Alaska (Kodiak Harbor)	8/2/72	9/7/72
Pan Alaska Fisheries, Alaska (Kodiak Harbor)	8/2/72	9/7/72
Roxanne Fisheries, Inc. (Kodiak Harbor)	8/2/72	9/7/72
Ursin Seafoods, Alaska (Kodiak Harbor)	8/2/72	9/7/72
Whitney Fidalgo Seafoods, Alaska (Kodiak Harbor)	8/2/72	9/7/72
Borough of Edgewater, N.J. (Hudson River)	8/11/72	9/6/72
Town of West New York, N.J. (Hudson River)	8/11/72	9/6/72
Jersey City Sewerage Authority, Jersey City, N.J. (Hudson River and Newark Bay)	8/11/72	9/7/72
Town of Kearney, N.J. (Newark Bay)	8/11/72	9/7/72
City of Hoboken, N.J.	8/11/72	9/12/72

Item	Date of Letter	Date of Informal Hearing
(Hudson River)		
City of Bayonne, N.J. (Kill Van Kull)	8/11/72	9/12/72
Township of North Bergen, N.J. (Hudson River)	8/11/72	9/12/72
Wayne County, Mich. (Wyandotte Plant) (Trenton Channel-Detroit River)	8/29/72	10/17/72
City of Riverview, Mich. (Detroit River)	8/29/72	10/17/72
Knoxville, Tenn./Third Creek STP (Tennessee River)	9/10/72	10/7/72
City of Wildwood, N.J. (Grassy Sound/Atlantic Ocean)	9/12/72	
Borough of Wildwood Crest (Wildwood Crest, N.J.) (Richardson Sound)	9/12/72	
Middle Township Sewerage District #1, Cape May Court House, N.J. (Crooked Brook, Tributary of Hereford Inlet)	9/12/72	
Avalon Sewerage Authority (Great Sound) Avalon, N.J.	9/12/72	
City of North Wildwood (Hereford Inlet) North Wildwood, N.J.	9/12/72	
Ocean City, N.J. (Great Egg Harbor Bay)	9/12/72	
Borough of Stone Harbor, Stone Harbor, N.J. (Great Channel)	9/12/72	
Sea Isle City (Ludlam's Thorofare) Sea Isle City, N.J.	9/12/72	
Borough of Avon-by-the-Sea (Atlantic Ocean) Avon-by-the-Sea, N.J.	9/12/72	
Borough of Bradley Beach (Atlantic Ocean) Bradley Beach, N.J.	9/12/72	
Borough of Neptune City (Atlantic Ocean) Neptune City, N.J.	9/12/72	
Borough of Neptune Township (Atlantic Ocean) Neptune Township, N.J.	9/12/72	
Ocean Grove Camp Meeting Assoc. of Meth. Church (Atlantic Ocean) Ocean Grove, N.J.	9/12/72	
Cuyahoga County Sewer District #6 (Lake Erie) (Rocky River Plant) Cleveland, O.	9/18/72	10/31/72
Cities Service Corporation (Ocoee River) Copperhill, Tenn.	10/2/72	

Item	Date of Letter	Date of Informal Hearing
Menasha Corporation, John Strange Paper Co. (Fox River-Lake Michigan) Neenah, Wis.	10/5/72	11/28/72
Mead Corporation, Gilbert Paper Co. (Fox River-Lake Michigan) Menasha, Wis.	10/5/72	11/28/72
City of Menasha, Wis. (Fox River-Lake Michigan)	10/5/72	11/28/72
Kimberly-Clark Corporation (Fox River-Lake Michigan) (Lakeview Mill) Neenah, Wis.	10/5/72	11/28/72
Kimberly-Clark Corporation (Fox River-Lake Michigan) (Badger-Globe Mill) Neenah, Wis.	10/5/72	11/28/72
City of Neenah, Wis. (Fox River-Lake Michigan)	10/5/72	11/28/72
Neenah-Menasha Sewerage Commission (Fox River-Lake Michigan) Menasha, Wis.	10/5/72	11/28/72
City of Appleton, Wis. (Fox River-Lake Michigan)	10/5/72	11/29/72
Wisconsin Tissue Mills, Menasha, Wis. (Fox River-Lake Michigan)	10/5/72	11/28/72
George A. Whiting Paper Company (Fox River-Lake Michigan), Menasha, Wis.	10/5/72	11/28/72
Kimberly-Clark Corporation (Fox River-Lake Michigan) Neenah, Wis. (Neenah Paper Mill Div.)	10/5/72	11/28/72
Consolidated Papers, Inc. (Fox River-Lake Michigan) Appleton, Wis.	10/5/72	11/29/72
Bergstrom Paper Company (Fox River-Lake Michigan) Neenah, Wis.	10/5/72	11/28/72
Riverside Paper Company (Fox River-Lake Michigan) Appleton, Wis.	10/5/72	11/29/72
Granite City, Ill. (Mississippi River)	10/13/72	12/7/72
Village of Sauget, Ill. (Mississippi River)	10/13/72	12/6/72
The East Side Levee and Sanitary District, East St. Louis, Ill. (Mississippi River)	10/13/72	12/6/72
City of East St. Louis, Ill. (Mississippi River)	10/13/72	12/7/72
PPG INDUSTRIES (Caribe) Ponce, Puerto Rico (Guyanilla Bay)	10/16/72	

Appendix B

FEDERAL WATER POLLUTION CONTROL ACT ENFORCEMENT CONFERENCE-TYPE ACTIONS (12-3-70/9-30-72)

2/18-19/71 —Convened Second Session of *Dade County, Florida*, Enforcement Conference, at Miami, Florida.

2/23-24/71 —Reconvened Enforcement Conference for *Escambia River and Bay*, Alabama-Florida, at Pensacola, Florida.

2/25-26/71 —Reconvened Enforcement Conference for *Perdido Bay*, Florida-Alabama, at Pensacola, Florida.

3/2/71 —Approved Clean-up program for *Mobile Bay, Alabama*, calling for completion of abatement measures not later than 2/15/73 (Enforcement Conference had been held 1/27/28, 1970, at Mobile, Alabama).

3/23-25/71 —Reconvened Enforcement Conference for *Lake Michigan and its Tributary Basin, Wis.-Ill.-Ind.-Mich.*, to establish thermal discharge standards, at Chicago, Illinois.

4/5-7/71 —Held *Water Quality Standards-Setting Conference for the Interstate Waters of Alabama*, at Montgomery, Alabama (Sec. 10(c)(2) of FWPCA).

4/13-14/71 —Convened initial session of Enforcement Conference for *Long Island Sound*, Connecticut-New York, at New Haven, Connecticut.

4/22-23/71 —Reconvened Enforcement Conference on *Lake Superior and its Tributary Basin, Minn-Wis-Mich*, to consider Reserve Mining Co.'s taconite tailings disposal plans, at Duluth, Minnesota.

4/29-30/71 —Held progress meeting of *Potomac River Enforcement Conference, Maryland-D.C.-Virginia*, at Washington, D.C.

5/14/71 —Approved Cleanup program developed by 3/23-24/71 *Lake Michigan Enforcement Conference, Wis.-Ill.-Ind.-Mich.*

5/26/71 —Approved Cleanup program for the *Androscoggin River, New Hampshire-Maine*, growing out of the October 21, 1969 Conference Session.

5/26/71 —Approved Clean-up program for the *Pearl River, Mississippi-Louisiana*, growing out of the November, 1968, Conference Session.

6/7-9/71 —Convened initial session of Enforcement Conference for *Galveston Bay and its tributaries, Texas* (Shellfish Conference, Sec. 10(d) at Houston, Texas.

6/28/71 —Approvied Cleanup Program developed for *Dade County, Florida*, at the February, 1971 reconvened Enforcement Conference (See 1 above).

7/71 —Approved Cleanup Program for *Escambia River and Bay, Ala.-Fla.*, as developed by the February, 1971 reconvened Enforcement Conference.

7/2-3/71 —Convened Third Session of Enforcement Conference for *Dade County, Florida*, at Miami, Florida.

7/12/71 —Approved Cleanup Program for the *Merrimack and Nashua Rivers, N.H.-Mass.*, as developed by the October, 1970 reconvened Conference.

8/5/71 —Approved Cleanup Program for *Perdido Bay, Florida-Alabama*, developed at the 2/25/71 reconvened Enforcement Conference.

8/17/71 —Approved remedial program developed during 4/71 reconvened Enforcement Conference on *Lake Superior and its Tributary Basin, Minn.-Wis.-Mich.*, and advised that 180-Day Notice had been served on Reserve Mining Company.

8/24–25/71 —Reconvened 1963 Enforcement Conference on the *Monongahela River, W.Va.-Md.-Pa.* to adopt remedial actions for acid mine drainage and other remaining pollution problems, at Pittsburgh, Pa.

9/21–23/71 —Convened initial Session of the Enforcement Conference (Shellfish) to abate pollution of *Pearl Harbor, Hawaii*, at Honolulu, Hawaii.

9/30–10/1/71—Convened initial Enforcement Conference on the *Ohio River and its Tributaries* in the *Pittsburgh, Pa. area*, (Pa.-Ohio-*W.Va.*) to abate pollution in the reach from Pittsburgh to Chester, W.Va. Conference held at Pittsburgh, Pa.

10/1/71 —Approved remedial program developed during 12/8–9/70 Progress Evaluation Meeting of the Enforcement Conference on the *Potomac River, Md.-D.C.-Va.*

10/13/71 —Convened initial Enforcement Conference on the *Ohio River and its Tributaries in the Wheeling, W.Va. area* (*Ohio-W.Va.*) to abate pollution in the reach from Toronto to Shadyside, Ohio. Conference held at Wheeling, W.Va.

[p. B–1]

10/18/71 —Approved remedial program developed in Third Session (7/2–3/71) of Enforcement Conference for *Dade County, Florida.*

10/19/71 —Convened Enforcement Conference to abate mercury pollution in the waters of *Western South Dakota* (Whitewood Creek-Belle Fourche-Cheyenne River system, from past industrial discharges and natural sources.)

10/27/71 —Reconvened Enforcement Conference on *Boston Harbor and its Tributaries, Mass.*, at Boston, Mass. (Third Session)

11/2/71 —Reconvened Enforcement Conference for *Galveston Bay and its Tributaries, Texas*, to consider recommendations of joint Task Force on technical approach to development of remedial program.

11/10/71 —Approved remedial program developed during 9/30–10/1/71 initial session of the Enforcement Conference on the *Ohio River and its Tributaries in the Pittsburgh, Pa. area (Pa.-Ohio-W.Va.)*.

11/10/71 —Approved remedial program developed by 4/71 Conference on *Lake Superior and its Tributary Basin, Minn.-Wis.-Mich.*

11/11/71 —Held progress evaluation meeting of the *Potomac River Conference, Md.-D.C.-Va.*, at Washington, D.C.

11/17/71 —Approved remedial program developed during the Third Session of the 10/27/71 Enforcement Conference on *Boston Harbor and its Tributaries, Mass.*

11/19/71 —Held Progress Evaluation Meeting of the *Dade County, Fla.* Enforcement Conference.

11/29/71 —Approved remedial program developed during the 4/13–14/71 initial session of the Enforcement Conference for *Long Island Sound, Conn.-N.Y.*

12/7–8/71 —Convened initial Enforcement Conference to curb pollution of *Mount Hope Bay, Mass.-R.I.* (Conference called under Shellfish provision of FWPC Act), at Providence, R.I.

12/15/71 —Approved remedial program developed during the 8/24–25/71 Second Session of the Enforcement Conference for the *Monongahela River and its Tributaries, Md.-Pa.-W.Va.*

12/16/71 —Approved remedial program developed during the 9/21–23/71 initial Session of the Enforcement Conference for *Pearl Harbor and its Tributaries, Hawaii.*

12/23/71 —Approved remedial program developed during the 10/19–21/71 initial session of the Enforcement Conference for the navigable waters of *Western South Dakota (Whitewood Creek-Belle Fourche-Cheyenne River System), S.D.*

1/7/72 —Approved remedial program developed during the 11/2/71 session of the Enforcement Conference for *Galveston Bay and its Tributaries, Texas.*

1/6/72 —Reconvened Enforcement Conference on *Mt. Hope Bay, Mass.-R.I.*

1/24–25/72 —Reconvened Enforcement Conference on *Escambia River and Bay, Alabama-Florida.*

1/25/72 —Approved remedial program developed during 10/13/71 initial session of the Enforcement Conference on the *Ohio River and its tributaries* in the *Wheeling, W.Va area (Ohio-W.Va.)* to abate pollution in the reach from Toronto to Shadyside, O.

1/26/72 —Held Progress Evaluation Meeting on *Perdido Bay, Fla.-Ala.*

2/9/72 —Accepted Summary of Progress Evaluation Meeting of 10/5/71 for the Enforcement Conference on the *Potomac River, Md.-D.C.-Va.*, as reconvened 11/11/71, urging timely implementations of Interim Treatment Program.

2/15–17/72 —Convened the Seventh Session of the Enforcement Conference for the interstate waters of the *Colorado River (Calif.-Colo.-Utah-Ariz.-Nev.-N.M.-Wyo.)* to address pollution problems associated with uranium mill tailings piles and increasing river salinity concentrations. Conference was held at Las Vegas, Nevada.

3/22/72 —Convened initial session of Enforcement Conference for the *middle reach of the Savannah River, Ga.-S.C., at Augusta, Georgia.*

4/26–27/72 —Reconvened Seventh Session of the *Colorado River Enforcement Conference (alif.-Colo.-Utah-Ariz.-Nev.-N.M.-Wyo.)* to adopt final recommendations for controlling salinity and abating pollution from uranium mill tailings.

6/9/72 —Approved remedial program developed during Seventh Session of the *Colorado River Enforcement Conference* (see entry above).

6/20–21/72 —Held Progress Evaluation Meeting for the Enforcement Conference on the *Potomac River* (*Md.-D.C.-Va.*).

7/20–21/72 —Reconvened Enforcement Conference on *Lake Michigan and its Tributary Basin* (*Wis.-Ill.-Ind.-Mich.*) to review compliance status.

[p. B–2]

Appendix C

FEDERAL WATER POLLUTION CONTROL ACT CASES REFERRED UNDER OIL POLLUTION PROVISIONS [1]

(12–3–70/9–30–72)

Item	Date Referred	Type of Spill	Section of FWPC Act	Referred
PLANTATION PIPELINE COMPANY Athens, Ga.; Case filed	4/20/71	Oil	11(b)(4)	To U.S. Atty
REVELO CORP., Sanford, Fla. Case filed	10/19/71	Oil	11(b)(5)	To Coast Guard
REFINERY CORP., Commerce City, Colo. (So. Platte R.) Case filed 3/14/72	11/17/71	Oil	11(b)(4)	To U.S. Atty; Fine $5,000 7/72 and 2 yrs. probation ($4,000 suspended)
BERKS ASSOCIATES, INC., Pa. (Schuylkill R.) Case filed	12/71	Oil	11(f)(2)	Pending
C.E. BELL, PLANT MANAGER, MARATHON PIPELINE COMPANY, Birds, Ill. (Embarras River to Wabash River) Case filed 7/28/72	12/6/71	Crude oil	11(b)(4)	To U.S. Atty
HESS OIL COMPANY, Perry County, Miss.; Case filed	12/7/71	Oil	11(b)(5)	To Coast Guard
COLONIAL PIPELINE COMPANY, Beaumont, Tex.; Case filed	12/9/71	Oil	11(b)(5)	To U.S. Atty; fine $1000 4/72
ROGER RODGERS, OWNER, Rodgers Oil Co., Savanna, Ill. (Miss. R.) Case filed on 2/1/72	12/15/71	Oil	11(b)(4)	
MID-CONTINENT PIPELINE CO. shing, Okla.; Case filed	1/11/72	Oil	11(e)	To U.S. Atty; pending
RISPIN COMPANY, Houston, Tex. Miss. River; Case filed	1/31/72	Oil	11(b)(4)	To U.S. Atty; pending
WAYNE BANISTER, FOREMAN, SANDACRES, INC., Woodacres Farm, Seymour, Ind. (Muscatatuek River) Case filed—5/1/72	3/10/72	Oil	11(b)(4)	To U.S. Atty; dismissed by Court 5/19/72; see Table D for suit against Corporation
OTIS AINSWORTH, Yazoo County, Mississippi (Big Black River)	3/15/72	Oil & salt water	11(b)(5)	To U.S. Coast Guard
ALLIED CHEMICAL CO., La. (Bayou Breaux-Miss. River)	3/15/72	Industrial waste	11	To U.S. Atty
CAROLINA MILLS, INC., Newton, N.C. (South Fork of atawba River)	3/16/72	Oil	11(b)(4)	Fined $500 9/72; case closed

[1] Excludes cases referred to U.S. Attorney under Refuse Act, or under both Refuse Act and FWPC Act, Section 11.

MR. R. Y. LUNSFORD, GULF PIPELINE COMPANY, Trinity River —Liberty County (Texas)	5/9/72	Industrial waste	11(b)(4)	
MR. E. TOMPKINS, LIBERTY SHELL AND MATERIALS COMPANY, Trinity River—Liberty County (Texas)	5/9/72	Industrial waste	11(b)(4)	
R.H.S. CORPORATION, Ellsworth, Me. (Union River)	5/10/72	Oil spill		To U.S. Coast Guard
STEWART D. FENNER, EXECUTIVE VICE-PRESIDENT, PETROLEUM SPECIALTIES, INC., Flat Rock, Mich. (Smith Creek to Huron River)	6/9/72	Fuel oil	11(b)(4)	
R.A. HARTSELLE, DISTRICT ENGINEER, CHICAGO & EASTERN ILLINOIS RAILROAD, Dolton, Ill. (Little Calumet River) Case filed 6/28/72	6/26/72	Oil spills	11(b)(4)	To U.S. Atty
H.P. LUKEHART, DIVISIONAL MEHANICAL OFFICER, CHICAGO AND NORTH WESTERN RAILWAY CO., Minneapolis, Minn. (Bassetts Creek to Miss. River)	6/28/72	Fuel oil discharge	11(b)(4)	
H.E. APPLEGATE, Supt., SOHIO PIPELINE CO., INC., Carmi, Ill. (French Crk to Wabash River)	8/14/72	Oil pipeline leak	11(b)(4)	To U.S. Atty
VOLUNTEER ASPHALT CO., Knoxville, Tenn. (Ft. Loudon Res./Tenn. R.)	9/22/72	Oil and asphalt	11(b)(4) 11(b)(5)	To U.S.C.G.
B&R TRANSPORT CO., Rutherfordton, N.C. (Broad River)	9/29/72	Oil	11(b)(4) 11(b)(5)	To U.S.C.G.; to U.S. Atty
PATRICK PETROLEUM CO. Choctaw Bluff, Ala. (Alabama River)	9/29/72	Crude oil spill	11(b)(5)	To U.S.C.G.

Appendix D

REFUSE ACT [1]
CIVIL CASES REFERRED TO JUSTICE DEPARTMENT BY EPA (12-3-70/10-18-72)

Item	Date Referred	Case Filed	Status
JONES & LAUGHLIN STEEL CORP., Cleveland, O. (Cuyahoga River) Cyanide, phenols, etc.	12/17/70	12/18/70	Consent decree ent. 12/16/71
ARMCO STEEL CORP., Houston, Tex. (Houston Ship Channel) Cyanide, phenols, etc.	1/15/71	12/9/70	Consent decree ent. 11/4/71
ITT-RAYONIER, Port Angeles, Wash. (Puget Sound) Sulphite waste liquor	1/31/71	3/30/71	Stipulation ent. 3/31/71
KOPPERS CO., Follansbee, W.Va. (Ohio River) Phenols, cyanide	2/17/71	3/24/71	Consent decree in negotiation
NATIONAL STEEL CORP., Weirton, W.Va. (Ohio River) Cyanide	4/21/71	5/11/71	Consent decree in negotiation
WHEELING-PITTSBURGH STEEL CORP., Steubenville, O. (Ohio River) Oil, Cyanide	4/21/71	5/17/71	Pending
CHASE BAG CO., Chagrin Falls, O. (Chagrin River) BOD, suspended solids, dyes	4/21/71	5/17/71	Consent decree filed 10/6/72
ROHM & HAAS, Deer Park, Tex. (Houston Ship Channel) Ammonia, BOD, nickel	5/4/71	7/19/71	Order being drafted
KITCHEN-QUIP, INC., Waterloo, Ind. (Cedar Creek) Chromium, nickel, oil	5/5/71	5/71	Consent decree ent. 10/24/72
GROWERS CO-OP, Westfield, N.Y. (Chatauqua Creek) BOD, color solids	5/6/71	8/9/71	Consent order ent. 11/9/71
ENECA FOODS, Westfield, N.Y. (Lake Erie) BOD, color, solids	5/6/71	8/9/71	Plt. sold to Welch Foods, see entry below
WELCH FOODS, INC., Westfield, N.Y. (Chatauqua Crk, Lake Erie) BOD, color, solids	5/6/71	8/9/71	Consent order 11/9/71
WHEELING-PITTSBURGH STEEL CORP., Follansbee, W.Va. (Ohio River) Phenols	5/7/71	5/17/71	Consent decree negotiation
WHEELING-PITTSBURGH STEEL CORP., Monessen, Pa. (Monongahela R.) Phenols, cyanides, suspended solids	5/7/71	5/17/71	Pending
ALASKA LUMBER & PULP CO., Sitka, Alaska (Silver Bay) Solids, organics	5/17/71	Not filed	—
CLOW CORPORATION, Tarrant, Ala. (Five Mile Creek) Alk. pH, Phenols, oil & grease, solids, etc.	6/2/71	Dropped	—
ALABAMA BY-PRODUCTS, Tarrant, Ala. (Five Mile Creek) Phenols, cyanide, oil & grease, zinc	6/2/71	6/18/71	Consent agreement in preparation

[1] Section 13 of the River and Harbor Act of 1899.

U.S. PIPE AND FOUNDRY CO., Complex, N.E. Birmingham area, Ala. (Five Mile Creek) Phenols, cyanide, metals	6/2/71	6/16/71	Consent agreement in negotiation
McWANE CAST IRON PIPE CO., Birmingham, Ala. (Trib. of Village Creek) Heat, alk. pH, phenols, cyanide, metals, etc.	6/2/71	6/16/71	Technical abatement req'ts under evaluation
U.S. STEEL CORP., Fairfield, Ala. (Opossum Creek) Oil & grease, acid pH, metals	6/2/71	6/14/71	Consent decree ent. 10/19/72
KOPPERS COMPANY, INC., Birmingham, Ala. (Trib. of Opossum Creek) Phenols, cyanide, oil & grease, metals	6/2/71	6/22/71	Consent agreement in negotiation
NASHVILLE BRIDGE, Bessemer, Ala. (Trib. of Valley Creek) Zinc, iron manganese, lead	6/2/71	6/22/71	Technical abatement req'ts under evaluation
NICK GEORGE, Brattleboro, Vt. (West River) Building materials	6/18/71 [2]	6/18/71	Court order issued to remove materials from river
NATIONAL FARMERS ORGANIZATION, Omaha, Nebr. (Missouri River)	8/17/71 [2]	Not filed	Prosecution declined
AMERICAN CAN CO., Rothchild, Wis. (Wis. R.) COD, solids. phosphorus	8/27/71		Technical abatement
LAUPAHOE SUGAR CO., Hamakua Coast, (Isld. of Hawaii) Sugar mill wastes	9/3/71	10/72	Pending
HONOKOA SUGAR CO., Hamakua Coast, (Isld. of Hawaii) Sugar mill wastes	9/3/71	10/72	Pending
HAMAKUA MILL CO., Hamakua Coast, (Isld. of Hawaii) Sugar mill wastes	9/3/71	10/72	Pending
PAAHAU SUGAR CO., Hamakua Coast, (Isld. of Hawaii) Sugar mill wastes	9/3/71	10/72	Pending
PEPEEKEO SUGAR CO., Hamakua Coast, (Isld. of Hawaii) North Plant; sugar mill wastes	9/3/71		Pending
PEPEEKEO SUGAR COMPANY, (Hamakua Coast) South Plant; Sugar mill wastes; Hawaii	9/3/71		Pending
HUTCHINSON SUGAR COMPANY, Hamakua Coast, (Isld. of Hawaii) Sugar mill wastes	9/3/71		Pending
MAUNA KEA SUGAR COMPANY, North Plant (Isld. of Hawaii) Sugar mill wastes	9/3/71		Pending
MAUNA KEA SUGAR COMPANY, South Plant, (Isld. of Hawaii) Sugar mill wastes	9/3/71		Pending
IRON OXIDE CORPORATION, Elizabeth, N.J. (Arthur Kill) Lime filter waste	10/21/71 [2]	1/7/72	Pending; see Table D for results of criminal charges
CENTRAL RAILROAD OF NEW JERSEY, Raritan, N.J. (Raritan R.) Oil	11/15/71 [2]	12/20/71	Consent decree under evaluation
BOROUGH OF EDGEWATER, Edgewater, N.J. (Hudson River) Refuse, shoreside dump	11/24/71 [2]		Pending
GEORGIA-PACIFIC CORPORATION, Woodland, Me. (St. Croix River) Logging and paper wastes	11/29/71 [2]	1/5/72	Pending
BAYONNE INDUSTRIES, Bayonne, N.J. (Kill Van Kull) Oil discharges	12/8/71 [2]		Pending
A. GROSS AND COMPANY, Div. of Milmaster Onyx, Newark, N.J. (Newark Bay) Solids, oil, grease	12/6/71 [2]	1/11/72	Abatement req'ts under negotiation

[2] Referred by regional office.

Item	Date Referred	Case Filed	Status
PHELPS-DODGE, Maspeth, N.Y. (Newton Creek) Copper, zinc, acidic, thermal waste	12/22/71[2]		Abatement req'ts under evaluation
CENTRAL STATES PAPER AND BAG COMPANY Palatka, Fla. (St. Johns River) Paper wastes	12/71	1/72	Case dropped 11/72; pollution abated voluntarily
RESERVE MINING COMPANY (Silver Bay) Minn. Solids, etc.	1/20/72	2/17/72	Pending
POWELL & MINNOCK BRICK WORKS (Subsid. of General Dynamics, Inc.) Coeymans, N.Y. (Hudson River) Oil discharge	2/4/72[2]		Pending
INTERNATIONAL INDUSTRIES, Sayreville, N.J. (Raritan River) Oil discharge	2/4/72[2]		Pending
BIG BLUE RIVER TRASH DUMP (Marjorie White, Owner) Kansas City, Mo.	2/9/72	Not filed	Prosecution declined 6/20/72
CITY OF CARUTHERSVILLE, Mo. (Miss. R.) Land fill dump refuse	2/15/72[2]	Not filed	Pollution stopped; new sanit. fill to be operational by 7/72
CITY OF OSAWATOMIE, Kansas (Marais des Cygnes River) Land fill dump refuse	2/28/72[2]	Not filed	Dump to close 6/1/72; site to be rehabilitated
HOOKER CHEMICAL COMPANY, Industrial Chemicals Division, Niagara Falls, N.Y. (Niagara River) Mercury	3/10/72[2]		
HOUSTON LIGHTING & POWER COMPANY, Texas (Cedar Bayou Trin. Bay) Thermal discharge	3/17/72	3/28/72	Pending in court
HOOVER BALL & BEARING COMPANY, Beatrice, Neb., (Blue River) Acid waste water	3/30/72		Consent order in draft
KAISER REFRACTORIES, Moss Landing, Calif. (Moss Landing Harbor) Trib. of Monterey Bay	4/17/72		
TOWN OF ISLIP, NEW YORK, (Awixa Creek, trib. of Great Cove. Domestic and industrial wastes	4/20/72		
JELLICO INDUSTRIES. INC., (Pickett Company) Tenn. (Holbert Creek) Acid and salt	5/72		
ANAHEIM CITRUS PRODUCTS COMPANY, Yuma, Ariz. (Colorado River) Citrus wastes	5/18/72		Consent decree in negotiation
GROWERS CITRUS PRODUCTS COMPANY, (Colorado River) (Yuma, Ariz.) Citrus wastes	5/18/72		Consent decree in negotiation
CUSTOM CANNERS, Atlanta, Ga. Cannery wastes (Peachtree Creek)	6/1/72	6/9/72	Consent decree ent. 8/25/72
ST. REGIS PAPER COMPANY, Atlanta, Ga. (Paper wastes) (Peachtree Creek)	6/1/72	6/9/72	Consent decree ent. 7/27/72
PAN-PACIFIC FISHERIES, INC., Los Angeles, Calif. (Outer L.A. Harbor) Fish processing wastes	6/9/72	Not filed	Voluntary abatement commitment being drafted
STAR-KIST FOODS, INC., Subsid. of H.J. Heintz Company, Los Angeles, Calif. (2 Plants) Outer L.A. Harbor; Fish processing wastes	6/9/72	Not filed	Same as above
CALIFORNIA MARINE PACKING COMPANY, Division of Westgate-California Foods, Inc. (Los	6/9/72	Not filed	Same as above

[2] Referred by regional office.

Angeles, Calif.) Outer L.A. Harbor; Fish processing wastes	6/9/72	Not filed	Same as above
VAN CAMP SEAFOODS COMPANY, Division of Ralston Purina Company, Los Angeles, Calif. (Outer L.A. Harbor) Fish processing wastes			
SOUTHWEST CITY, MO., (Cave Springs, Branch) Poultry wastes	6/12/72		
SULLIVANS ISLAND, S.C., Trash and garbage	6/14/72		
AMERICAN CYANAMID, Savannah, Ga. (Acid) (Savannah River)	6/16/72		
CHICAGO AND EASTERN ILLINOIS RAILROAD,	6/27/72	6/29/72	
Dolton, Ill. (Little Calumet River) Oil	7/6/72	8/18/72	
WHITTAKER CORP. and CITY OF MEMPHIS, TENN. (Mississippi River) Textile wastes	7/7/72	7/21/72	
MOUNTAINEER COAL CO., Fairmont, W.Va. (Trib. of Monongahela R.) Acid mine drainage	7/7/72	10/72	
K & W OIL CORP., Casper, Wyo. (North Platte River)	7/13/72	7/13/72	
TOMS RIVER CHEMICAL CORP., Toms River, N.J. (Atlantic Ocean) Industrial wastes			
FMC CORP., Baltimore, Md. (Baltimore Harbor) Industrial wastes	7/21/72		
NATIONAL MOLASSES, Omaha, Neb. (Missouri River) Molasses refuse	8/3/72	8/10/72	Pending in court

[p. D-3]

OZARK-MAHONING MINE & MILLING CO. (Pinkham Creek, trib. of North Platte River) Cowdrey, Colo.	8/72	9/6/72	Pending in court
PHILLIPS BOATYARD & LAWRENCE OWENS, Wanchese, N.C. (Croatau Sound) Dredge & fill refuse	8/7/72	8/25/72	Pending in court
SAM BEACHEM, Kitty Hawk, N.C. (Currituck Sound) Dredge & fill refuse	8/7/72	8/25/72	90-day injunction ordered 9/1/72
OWEN FULFORD, Harkers Island, N.C., (Core Sound) Dredge & fill refuse	8/7/72	8/25/72	Injunction ordered 9/1/72 until case heard on merits
CROWN ZELLERBACH CORPORATION, St. Francisville, La. (Mississippi R.)	8/28/72		
GEORGIA PACIFIC CORPORATION, Crossett Division, Port Hudson, La.	9/13/72		
BEAUNIT CORPORATION, Elizabethton, Tenn. (Watauga River) Textile wastes	9/18/72		
BEMBERG INDUSTRIES, INC., Elizabethton, Tenn. (Watauga River)	9/18/72		
AMERICAN CYANAMID COMPANY, Marietta, O. (Ohio River) Ammonia to Marietta STP	9/25/72		
CITY OF MARIETTA, O. (Ohio River) Inadequate treatment of ammonia-bearing wastes from American Cyanamid Company	9/25/72		
CONSOLIDATED PAPER COMPANY, Biron, Wis. Plant (Wisconsin River) Groundwood/paper mill wastes	9/27/72		
CONSOLIDATED PAPER CORPORATION, Whiting, Wis. Plant (Wisconsin River) Groundwood/paper mill wastes	9/27/72		

Item	Date Referred	Case Filed	Status
CONSOLIDATED PAPER CORPORATION, Wisconsin Rapids, Wis. (Wisconsin River) Paper/paperboard wastes	9/27/72		
CONSOLIDATED PAPER CORPORATION, Steven Point, Wis. (Wisconsin River) Paper mill wastes	9/27/72		
CONSOLIDATED PAPER CORPORATION, Wisconsin Rapids, Wis. (Wisconsin River) Kraft pulping wastes	9/27/72		
NEKOOSA-EDWARDS PAPER COMPANY, Port Edwards, Wis. (Wisconsin River) Pulp/paper wastes	9/29/72		
NEKOOSA-EDWARDS PAPER COMPANY, Nekoosa, Wis. (Wisconsin River) Pulp/paper wastes	9/29/72		
NEKOOSA-EDWARDS PAPER COMPANY Whiting-Plover, Wi. (Wisconsin River) Pulp/paper wastes	9/29/72		
GEORGIA-PACIFIC CORPORATION, Tomahawk, Wis. Paper Mill (Wisconsin River) Paper mill wastes	9/29/72		
AMERICAN CAN COMPANY, Rothchild, Wis. (Wisconsin River) Sulfite pulp/paper wastes	9/29/72		
U.S. STEEL CORPORATION, Waukegan Works, Ill. (Lake Michigan) Cooling, rinse & boiler blowdown wastes	10/3/72		
ST. REGIS PAPER COMPANY, Rhinelander, Wis. (Wisconsin River) Sulfite pulp/paper wastes	10/4/72		
MOSINEE PAPER MILLS COMPANY, Mosinee, Wis. (Wisconsin River) Kraft pulp/paper wastes	10/4/72		
PEABODY COAL COMPANY, Vigo County, Ind. (North Coal Creek) Coal refuse piles	10/12/72	10/72	Pending in court
KAISER ALUMINUM AND CHEMICAL CORP. Baton Rouge and Gramercy, La. (Mississippi River)	10/13/72	10/13/72	Consent decree filed simultaneously on 10/13/72

Appendix E

REFUSE ACT [1]
CRIMINAL CASES REFERRED TO JUSTICE DEPARTMENT BY EPA (12-3-70/10-18-72)

Item	Date Referred	Remarks
JONES & LAUGHLIN STEEL CO., Cleveland, Ohio (Cuyahoga River) Case filed 12/70	12/70 [2]	Oil Spill; fined $5,000—2/12/71
U.S. PLYWOOD-CHAMPION PAPER CO., Hamilton, Ohio (Great Miami River) Case filed 12/70	12/17/70 [2]	Fish Kill; fined $7,500 on 5/3/71
GEO. W. CREEK, d/b/a GREEK OIL CO., Jacksonville, Fla.; Case filed	4/16/71	Oil Spill
ILLINOIS CENTRAL RAILROAD, Star, Miss. Case filed	4/20/71	Oil Spill
CRYSTAL TISSUE, Middletown, Ohio (Great Miami River) Case filed 8/3/71	4/20/71 [2]	Red Paper Dye; Pleaded "nolo" fined / /71
METROPOLITAN PETROLEUM CO., Plattsburgh, N.Y. (Lake Champlain) Case filed 7/6/71	4/28/71 [3]	Oil spill; fined $500 and reimbursed U.S. $1,300
B&O RAILROAD, Willard, O. (Jacobs Creek, trib. of Huron River) Case filed 7/30/71	5/5/71 [2]	Diesel Fuel Spill; fined $1,000 9/3/71
CHAMPLIN OIL REFINERY, Enid, Okla. (Skeleton Creek) Case filed	5/5/71 [2]	Fish Kill; Ammonia
ALASKA LUMBER & PULP CO., Sitka, Alaska (Silver Bay) Case filed	5/17/71 [2]	Fish Kill; solids, organics
NEW ENGLAND POWER CO., Somerset, Mass. (Mt. Hope Bay) Case filed	5/21/71	Fish Kill; chlorine
BONA ALLEN, INC., Buford, Ga. Case filed 9/2/71	6/21/71	Pending in Court
BOB MULLIN, d/b/a STINSON HOLLOW BOATYARD, Muscle Shoals, Ala.; Case filed	6/23/71	Oil Spill
ROYAL MANOR HOUSEWARES CO., Los Angeles, Calif.; (Ballona Creek to Santa Monica Bay) Case filed 12/8/71	6/24/71	Cyanide spill; fined $2,000 on 3/6/72
SPEEDWAY WRECKING CO., Chicago, Ill.	7/21/71	Dumping rubble Declined prosecution 12/18/71
BAY CITIES EXCAVATION CO., Montara, Calif.; Case not filed	7/29/71	Prosecution declined
GEORGIA POWER CO., Rome, Ga. (Coosa R.) Case filed 9/2/71	8/26/71	Oil Spill; fined $1,500 on 6/2/72
BULK TERMINALS CO., Chicago, Ill. Case not filed	9/1/71	Dark Liquid; prosecution declined
TABOR CO., La Salle, Ill.	9/1/71	Dumping corn hulls Prosecution declined 2/3/72
INLAND TUGS CO., Jeffersonville, Ind. Case dismissed	9/1/71	Dumping garbage Paid $500 in lieu of rem proceedings
PEABODY COAL CO., Columbia, Mo. (Hinkson Crk. trib. of Mo. River) Case filed	9/14/71	Mine Acid
PHILLIPS PETROLEUM CO., Sedalia, Mo. (Flat Crk., trib. of Mo. River) Case filed	9/14/71	Gasoline spill
ATCHISON COUNTY COOPERATIVE, Rock Port, Mo. (Rock Creek, trib. of Mo. River) Case filed	9/14/71	Ammonia spill
HECK FERTILIZER CO., Mound City, Mo. (Davis Creek, trib. of Mo. River) Case filed	9/14/71	Ammonia spill

[1] Section 13 of the River and Harbor Act of 1899.
[2] Referred by EPA headquarters—Washington.
[3] Referred to Justice Department for prosecution under both Refuse Act and FWPC Act, Section 11 (Oil).

Item	Date Referred	Remarks
JEFFERSON BEACH MARINA CO., Osweko, N.Y. (Lake Ontario) Case filed	9/24/71	Oil spill
NEW DEPARTURES CO., Sandusky, O.	9/28/71 [3]	Oil spill. Declined prosecution 12/18/71
SHELL CHEMICAL CO., Ventura, Calif. (Ventura River) Case filed 12/8/71	10/1/71	Pleaded "nolo"; fined $5,000 on 1/24/72
MONTROSE CHEMICAL CO., Santa Monica, Case not filed	10/1/71	Prosecution declined
PENNZOIL PRODUCING COMPANY, Tinsley, Miss.; Case filed	10/8/71	Oil spill
MOBIL OIL CORPORATION, Tinsley, Miss.; Case filed	10/8/71	Oil spill
TINKEY FARMS, INC., Harrison Twp, Fulton City, Ind.; Case filed on 2/7/72 (Tippecanoe River)	10/8/71	Fish kill; fined $1,000 on 5/25/72
HAMILTON OIL COMPANY, Evansville, Ind.; Case filed	10/8/71	Oil spill; fined $500 on 2/8/72
PALATINE DYEING COMPANY, St. Johnsville, N.Y.; Case filed 5/22/72 (Mohawk River)	10/12/71 [3]	Oil spill; fined $500 7/72
AMERICAN OIL COMPANY, Whiting, Ind., (Lake Michigan) Case not filed	10/15/71	Oil spill; Declined prosecution 1/20/72
IRON OXIDE CORPORATION, Elizabeth, N.J. (Arthur Kill) Case filed 6/8/72	10/21/71	Detergent spill; pleaded gity 1 ct. 6/13/72; sentence pends
ROCK ISLAND RAILROAD, Kansas City, Kansas (Kansas River) Case filed 4/12/72	11/9/71	Oil spill; trial set for 9/72; postponed
LIHUE PLANATION COMPANY, LTD & HAWAII BOARD OF HARBOR COMMISSIONERS, Nawiliwili Harbor, Hawaii; Case filed 11/26/71	11/15/71	Molasses spill; trial for 8/1/72
J. E. BAUER COMPANY, Patoka, Ind. Case filed 1/5/72	12/6/71	Oil spill; fined $500 on 4/28/72
MARATHON PIPELINE COMPANY, Birds, Ill. (Embarass River to Wabash River) Case filed 7/28/72	12/6/71 [3]	Oil spill; pending
WESTERN ELECTRIC COMPANY, Omaha, Neb. (Hell Creek, trib. of Papillion River) Case filed 1/28/72	12/7/71	Oil spill; fined $500 on 3/1/72; Consent decree entered
DIAMOND SHAMROCK CHEMICAL COMPANY, Painesville, O. (Grand River) Case filed	12/7/71	Chromium spill; Prosecution declined; previous 15-count criminal suit pending in Court (See Table G)
GETTY PIPE COMPANY, Hazelton, Pa. (Dockwater Creek, trib. of Raritan River) Case filed	12/8/71	Oil spill; pending
RODGERS OIL COMPANY, Savanna, Ill. (Mississippi River) Case filed 2/1/72	12/15/71 [3]	Oil spill; Refuse Act suit dropped; owner fined under 11(b)4; (See Table H)
AMERICAN SHIPBUILDING COMPANY, Lorain, O. (Black River) Case filed 3/71	12/15/71	Blasting sand; fined $500 on 3/23/72
U.S. STEEL CORPORATION, Gary Works, Gary, Ind.; (Grand Calumet River) Case filed 2/4/72	12/21/71	Oil spill; volun. dismissed due to local prosecution, same offense
GULF OIL COMPANY, Houston, Tex. Case filed	12/28/71	Oil spill
DUVAL SULPHUR COMPANY, Galveston, Tex.; Case filed	1/2/72	Sulphur; pending
INLAND OIL & TRANSPORT COMPANY, St. Paul, Minn. (Mississippi River) Case filed on 1/72	1/10/72	Oil spills (2); fined $500 on 5/5/72
UPPER MISSOURI RIVER CORPORATION, Salix, Iowa (Spill near Red Wing, Minn.)	1/10/72	Gasoline spill; Declined prosecution on 2/28/72
J. F. DONOVAN CONSTRUCTION COMPANY, St. Cloud, Minn.; Case filed	1/11/72	Hot mix plant; soot to air; thence to Lake Superior; declined prosecution 4/18/72
THEODORE ULAND, d/b/a CHEROKEE DRILLING COMPANY, Princeton, Ind. (Yellow Creek to Wabash River) Case filed 3/2/72	1/11/72	Oil field brine; fined $500 on 4/28/72
BARROWS COAL COMPANY, Brattleboro, Vt. (Connecticut River) Case filed 2/72	1/12/72	Oil spill; fined $250 on 3/15/72 for failure to report
TEX-GAS COMPANY, Hayti, (Missouri River) Mo.; Case filed	1/25/72	Oil spill

[p. E–1]

TEXACO OIL COMPANY, St. Louis, Mo. (Mississippi River) Case filed	1/31/72	
FMC CORPORATION, ORGANIC CHEMICALS DIVISION, Baltimore, Md. (Baltimore Harbor) Case filed	2/1/72	Paint solvent (Toluene) discharge Indicted 6/20/72; pld guilty 7/24/72
UNIVERSAL CONTAINER ORPORATION, Marcus Hook, Pa. (Stoney Creek, trib. of Delaware River) Case filed	2/1/72	Oil and grease discharge (pending)
POWELL & MINNOCK BRICK WORKS, (Subsid of General Dynamics, Inc.) Coeymans, N.Y. (Hudson River) Case filed 2/72	2/4/72 [3]	Oil discharge; fined $500 on 3/20/72
INTERNATIONAL INDUSTRIES, Sayreville, N.J. (Raritan River) Case filed	2/4/72	Oil discharge
MID-CONTINENT PIPELINE COMPANY, Cushing, Okla. (Skull Creek, trib. of Cimarron River) Case filed	2/17/72	Oil spills; pending
M-K-T RAILROAD, Oklahoma, (Skull Creek, trib. of Cimarron River) Case filed	2/17/72	Oil spill; pending
KERR-MAGEE REFINERY, Cushing, Okla. (Skull Creek, trib. of Cimarron River) Case filed	2/17/72	Oil spill; pending
MIDLAND COOPERATIVE OIL REFINERY, Cushing, Okla (Skull Creek, trib. of Cimarron River) Case filed	2/17/72	Oil discharge; pending
OZARK-MAHONING MINING COMPANY, Cowdrey, Colo. (North Platte River) Case filed	2/18/72	Mine-mill wastes; pending
J. BURTON AYRES (Freighter) Lake St. Clair; Case filed	2/23/72	Garbage spill; pending
U.S. STEEL, South Works, Chicago, Ill. (Grand Calumet River) Calumet Harbor; Case filed	2/24/72	Oil spill; pending
CROWN CENTRAL PETROLEUM CORP., Houston, Tex. (Houston Ship Channel)	2/29/72	Oil discharge
ALLIED CHEMICAL COMPANY, Semet-Solvay Division; Detroit, Mich. (Rouge River) Case filed	3/10/72	Tar spill; prosecution declined 4/5/72
SANDACRES, INC., Seymour, Ind. Vernon Fork of Muscatatuck River) Case filed—5/1/72	3/10/72 [3]	Oil spill; pending
CAROLINA MILLS, Newton, N.C.	3/15/72 [3]	Oil spills (2)
BUCKEYE PIPELINE COMPANY, Rochester, Ind. (Tippecanoe River) Case filed 5/16/72	3/29/72	Oil spill; fined $1,500 9/1/72
CITIES' SERVICE COMPANY, Fort Meade Mine, Fort Meade, Fla. (Peace River) Case filed 5/11/72	2/9/72	Phosphate Waste
IOWA BEEF PROCESSORS, Dakota City, Neb. (Missouri River)	3/3/72	Indictment 5/9/72; fined $500 9/7/72; Consent decree ent. 9/18/72
MEAD CORPORATION, Chillicothe, O. (City System)	3/6/72	Indictment 7/10/72 Industrial wastes Olive wastes; case
VILLA d'ORO OLIVE COMPANY, Thermalito, Calif. (Trib. of the Feather River)	3/14/72	dropped at EPA request; pollution abated
INLAND CORPORATION, Cleveland, O. (Chippewa Creek) Vermillion River (Case filed 5/16/72)	4/10/72	Gasoline spill; fish-kill; fined $1,000 8/8/72
SPENTONBUSH FUEL TRANSPORT SERVICE, INC., New York, N.Y. (Long Island Sound) off New London, Conn. Case filed 4/18/72	4/10/72	Tanker spill; fined $2,500 5/22/72
YOUNGSTOWN SHEET AND TUBE COMPANY, East Chicago, Ind. (Indiana Harbor Canal)	4/12/72	Suspended solids discharge; case dropped on $1,000 fine for previous offense
HUTCHINSON UTILITIES COMMISSION, Hutchinson, Minn. (South Fork of Crow Creek)	4/12/72	Indictment 6/27/72; Oil spill; fined $1,000 7/14/72
DARLING AND COMPANY, Cleveland, O., (Cuyahoga River) Case filed 5/28/72	4/12/72	Tallow; Case dropped; Fined $500 by Coast Guard on 5/1/72
ALLIED CHEMICAL CORPORATION, Richmond, Calif. (Castro Creek—trib. of San Francisco Bay)	4/13/72	Sulfuric acid wastes; Case dropped; compliance obtained
CITY WIDE ASPHALT, INC., Independence, Co. (Mill Creek, trib. of Missouri River)	4/17/72	Indictment 5/10/72; fined $500 plus 1-yr probation, 9/7/72
AMALGAMATED SUGAR COMPANY, Twin Falls, Ida. (Rock Creek)	4/20/72	Rupture of a dike
AMERICAN SMELTING AND REFINING COMPANY, Baltimore, Md. (Baltimore Harbor)	4/27/72	Arsenic discharges; 50-count indictment returned 7/11/72

Item	Date Referred	Remarks
AMERICAN SUGAR REFINING COMPANY, Baltimore, Md. (Baltimore Harbor)	4/27/72	Organic sugar
ALLIED CHEMICAL COMPANY, Baltimore, Md. (Baltimore Harbor)	4/27/72	Chromium discharge; fined $24,000 on 9/12/72
SCM CORPORATION, (Glidden-Durkee Div.) Baltimore, Md. (Baltimore Harbor)	4/27/72	Zinc & cadmium; prosecution declined
NORTON COMPANY, Watervliet, N.Y. Hudson River, Case filed 6/26/72	5/1/72	Oil spill
REPUBLIC STEEL CORPORATION, Cleveland, O. (Cuyahoga River) Case filed 5/8/72	5/5/72	Fined $1000 on 5/17/72; Industrial wastes
U.S. AGRI-CHEMICAL COMPANY, Nashville, Tenn. (Cumberland River) Case filed 6/29/72	5/5/72	Acid; fined $500 7/72
VALLEY OIL COMPANY, Huntington, Mass. (Westfield River—trib. of Connecticut River) Case filed 6/15/72—Pending	5/9/72	#2 fuel oil spill; pending
UNION PACIFIC RAILROAD COMPANY, Pocatello, Ida.	5/15/72	Oil discharge
PBI GORDON CORP., Kansas City, Kans. (Kansas River)	5/4/72	Chemical wastes
HENNINGSEN FOODS, INC., Malvern, Iowa (Silver Creek)—trib. of Missouri River	5/16/72	Wastes, including salmonella; fined $1,000 8/72
VALENTINE FISHERIES, INC., Suamico, Wis. (Big Suamico River)	5/16/72	Indictment 6/14/72; BOD and high coliform counts
TWIN CITY FUEL, INC., Barre, Vt.; (Stevens Branch, Winooski River)	5/17/72	#2 fuel oil spill; pending
		[p. E–2]
FARM STORES, INC., (Milk & Ice Cream) Miami, Fla. (58 St. Canal)	5/19/72	BOD and solids; prosecution declined; abatement underway
BUTLER AVIATION, Miami Fla. (Airport Canal to Tamiami Canal)	5/19/72	Oil; prosecution declined; abatement underway
SKIL CORPORATION, Chicago, Ill., (North Branch of Chicago River) Case filed on 6/28/72	5/25/72	Fuel oil
LEADER CHEESE COMPANY, Reeseville, Wis. (Lau Creek)	5/26/72	Indictment 6/14/72; Wash waters
LOUISVILLE AND NASHVILLE RAILROAD, Evansville, Ind. (Ohio River) Case filed 6/72	5/30/72	Oil
HALQUIST STONE CO., Sussex, Wis. (Sussex Creek)	5/31/72	Indictment 6/14/72; Dissolved & suspended solids and phosphorus
F. R. BUSS AND COMPANY, Caroline, Wis. (Embarras River)	5/31/72	Untreated wastes; Dairy product wastes; Indictment 6/14/72 fined $500 8/7/72
BUCKEYE PIPELINE COMPANY, Rochester, Ind. (Tippecanoe River) Case filed 6/19/72	6/1/72	Oil spill; fined $1,500 9/1/72
MINNESOTA MINING AND MANUFACTURING COMPANY, (3M) St. Paul, Minn., 3M Creek to Mississippi River	6/2/72	Indictment 6/27/72 Phenolic resin; fined $500 10/2/72
DEL OIL AND GAS CORPORATION, Natchez, Miss. (Mississippi River)	6/6/72	Salt water
AMERICAN PETROFINA COMPANY, Natchez, Miss. (Mississippi River)	6/6/72	Oil & sale water
PETROLEUM SPECIALTIES, INC., Flat Rock, Mich. (Smith Creek to Huron River)	6/9/72	Oil
CENTURY ROAD OILING COMPANY, Flat Rock, Mich. (Huron River)	6/9/72	Black waste oil
KAISER REFRACTORIES, Mexico, Mo. (South Fork of Salt River)	6/12/72	Major fish kill, oil spill
FARMLAND FOODS, INC., Garden City, Kans. (Arkansas River)	6/14/72	Fish kill
PEJEPSCOT PAPER COMPANY, Brunswick, Me. (Androscoggin River)	6/23/72	#6 Fuel oil spill
CHICAGO AND EASTERN ILLINOIS RAILROAD, Dolton, Ill. (Little Calumet River) Case filed 6/29/72	6/27/72	Diesel fuel oil spills; prelim. injunction 6/30/72
CHICAGO AND NORTH WESTERN RAILWAY CO., Minneapolis, Minn. (Bassetts Creek to Mississippi River)	6/28/72	Fuel oil spill
BASIC CONSTRUCTION MATERIALS (Subsidiary of Davon, Inc.) Circleville, O. (Scioto River) Case filed 7/72	6/28/72	Concrete mixer wash

INFINGER TRANSPORTATION COMPANY, Charleston Heights, S.C. (Boon's Creek to Lake Keowee)	6/29/72	Oil spill
ALLIED CHEMICAL CORPORATION, Denver, Colo. (South Platte River) Case filed 7/14/72	7/72	Sulfuric acid spill; fish kill; fined $1,500 8/72
K & W OIL CORPORATION, Casper, Wyo. (North Platte River) Case filed 10/72	7/7/72	Oil
PHILLIPS PETROLEUM, Kansas City Refinery, Kans. (Missouri River)	7/20/72	Oil spills (2)
COLLIER DEVELOPMENT CORP., Naples, Fla. (Trib of Cocohatchee River) Case filed	7/26/72	Garbage
SCOFIELD MARINE CONSTRUCTION, Naples. Fla. (Culf of Mexico) Case filed 8/14/72	7/26/72	Muck & sludge; fined $500 9/14/72
GENERAL AMERICAN TRANSPORTATION CORP., Carteret, N.J. (Arthur Kill)	8/3/72	Mineral spirits spill 1/27/72; oil spill 2/10/72; Civil relief requested by EPA 8/18/72
J. C. KEETER REALTY CO., Atlantic Beach, N.C. (Bogue Sound) Case filed	8/7/72	Dredge & fill refuse
A & M GENERAL CORP., South Bend, Ind. (Bowman Creek to St. Joseph River)	8/14/72	Diesel fuel spill on 3/27/72
SOHIO PIPE LINE CORPORATION, Carmi. Ill. (French Creek to Wabash R.)	8/14/72	Oil pipeline leak 6/1/72
NATIONAL TRANSIT COMPANY, Oil City, Pa. (Allegheny River(Case filed	8/15/72	Oil spills
AUTOMOTIVE DISPOSAL CORP., Jacksonville, Fla (Trout River) Case filed 9/11/72	8/25/72	Shredded auto bodies
WYANDOTTE INDUSTRIES CORP., Waterville, Me. (Kennebec River)	9/20/72	Oil spills 3/72 and 7/72
MR. BEN DEHAVEN, Walton, Ind., Frick Transport, Inc., Wawaka, Ind., MR. EUGENE A. SMOLEK. Wawaka, Ind. (Phillips Ditch to Rock Creek to Wabash River) Case filed	9/21/72	Spill of ammonia-bearing liquid; fish kill
UNIROYAL, INC., Chicopee, Mass. (Chicopee River to Connecticut River)	9/24/72	Plasticizer "Paraflux" spills 10/72
WAUMBEC MILLS, INC., Manchester, N.H. (Mernmack River)	9/24/72	Oil seepage for underground tanks
ASHLAND OIL, INC., Evansville, Ind. (Ohio River) Case filed 10/72	9/25/72	Diesel fuel spill 8/26/72
COLT INDUSTRIES-CRUCIBLE, INC., Spring Division, Pittsburgh, Pa. (Allegheny River) Case filed	9/27/72	Oil spill
UNION OIL COMPANY OF CALIFORNIA, Mabscott, W.Va., (Trib. to New River) Case filed	9/27/72	Gasoline spill
REPUBLIC STEEL CORPORATION, Youngstown, Ohio Coke Plant (Mahoning River) Case filed	9/28/72	Coal tar spill 8/7/72
REPUBLIC STEEL CORPORATION, Cleveland, O. (Cuyahoga River)	9/29/72	Susp. solids bypass 6/72; (on breakdown of blast furnaces #5&6 clarifier)
KAISER ALUMINUM AND CHEMICAL CORP., Ravenswood, W. Va. (Ohio River) Case filed	9/29/72	Oil spill
BALTIMORE & OHIO RAILROAD COMPANY, Pittsburgh, Pa. (Monongahela River) Case filed	9/29/72	Oil spill
TRI-W TOWING COMPANY, Greenville, Miss. (Mississippi River) Case filed	10/4/72	Waste liquid discharge from barge(5/20/72 at Hastings, Minn.
WHEELING PITTSBURGH STEEL COMPANY, Yorkville, O .(Ohio River) Case filed	10/4/72	Hexavalent chromium discharge 3/30/72
WHEELING PITTSBURGH STEEL COMPANY, Martins Ferry, O. (Ohio River) Case filed	10/4/72	Industrial waste discharge 5/23 and 6/7/72
PALATINE DYEING COMPANY, St. Johnsville, N.Y. (Mohawk River) Case filed	10/12/72	Oil spill; fined $500 on 7/28/72
ALTON BOX BOARD COMPANY, Lafayette, Ind. (Mouth of Pearl River to Wabash River)	10/16/72	Industrial waste discharge 7/13/72; fish kill
INTERLAKE, INC., Toledo, O. (Maumee River) Case filed	10/16/72	Solids discharge 7/16/72 on blast furnace clarifier breakdown
B. F. GOODRICH COMPANY, Woodburn, Ind. (Maumee River) Case filed	10/16/72	Chemical wastes discharge 9/13/72

Appendix F
REFUSE ACT [1]

CASES REFERRED TO JUSTICE DEPARTMENT FOR NON-FILING OF PERMIT APPLICATIONS (12-3-70/9-30-72)

Name	Location	Date Referred	Remarks
Armstrong Chemical Co.	Janesville, Wis.	9/24/71	Prosecution declined; file closed
Atlantic Sulphur Terminal, Inc.	Carteret, N.J.	9/24/71	Prosecution declined; file closed
Bancroft Dairy	Marquette, Mich.	9/24/71	No permit req'd; file closed
Basset-Walker Knitting Co.	Basset, Va.	9/24/71	Prosecution declined; file closed
Benton-Harbor Malleable Industries	Benton Harbor, Mich.	9/24/71	Prosecution declined; file closed
Champale, Inc.	Trenton, N.J.	9/24/71	Prosecution req. withdrawn; file closed
Clermont Fruit Packers	Hudson, N.Y.	9/24/71	Civil & crim. filed 12/15/71; fined $12,500 11/72
Crown Prince Pet Foods	North Platte, Neb.	9/24/71	Not prosecuted; file closed; no permit
Denton Sleeping Garments	Centreville, Mich.	9/24/71	Prosecution declined; file closed
D & B Products	Youngstown, O.	9/24/71	Prosecution declined; file closed
Denver & Rio Grande Western Railroad Co.	Roper, Utah	9/24/71	Prosecution declined; permit appl. filed
Diventco, Inc.	New Milford, Conn.	9/24/71	Civil suit filed on 12/1/71; consent decree under negotiation
Eastern Foundry Co.	Boyertown, Pa.	9/24/71	Pending
El Dorado Terminal Corp.	Bayonne, N.J.	9/24/71	Prosecution declined 4/72
Forest Products Co.	Smelterville, Ida.	9/24/71	Pending
Foster Wheeler Corp.	Dansville, N.Y.	9/24/71	Request for prosecution
Kaiser Cement & Gypsum Corp.	Delanco, N.J.	9/24/71	withdrawn
Kennebec River Pulp & Paper	Madison, Me.	9/24/71	Criminal suit filed 10/19/71; fined $500 on 1/7/72
Lisbon Mills, Inc.	Lisbon Falls, Me.	9/24/71	Crim, suit filed 10/19/71
McRae Packing Co.	Edison, Wash.	9/24/71	Prosecution declined; file closed; permit filed
Meadowbrook Coal Co.	Lykens, Pa.	9/24/71	Prosecution request withdrawn; file closed; permit filed
Menominee Enterprises, Inc.	Neopit, Wis.	9/24/71	Prosecution withdrawn; file closed; permit filed
Metals Applied, Inc.	Cleveland, O.	9/24/71	Civil suit filed 10/2/71; case dismissed by court
Moline Malleable Iron Company	St. Charles, Ill.	9/24/71	Prosecution declined; file closed
Northwestern Steel & Wire Company	Sterling, Ill.	9/24/71	Prosecution declined; file closed
Remington Brothers Produce	St. Anthony, Ida.	9/24/71	Prosecution declined; 4/72
Ponce Asphalt Company	Ponce, Puerto Rico	9/24/71	
Schafer Manufacturing Company	Union City, Mich.	9/24/71	Prosecution declined; file closed
Stockton Cheese Co.	Stockton, Mo.	9/24/71	Civil suit 10/22/71; consent decree ent. 10/22/71; treatment facil. to be installed 2/1/72
			[p. F-1]
Tri-County Growers, Inc.	Monitor, Wash.	9/24/71	Declined prosecution; file closed
Union Pacific Railroad	Salt Lake City, Utah	9/24/71	Civil suit filed 10/12/71
U.S. Steel, Universal Atlas Cement Div.	Cohoes, N.Y.	9/24/71	
U.S. Steel, Universal Atlas Cement Div.	Hudson, N.Y.	9/24/71	Declined prosecution; file closed
U.S. Steel, American Bridge Div.	Trenton, N.J.	9/24/71	Request for prosecution withdrawn
Virginia Iron, Coal & Coke Company	Wise County, Va.	9/24/71	
Hope Valley Dyeing Corp. (EPA Region I) [1]	West Warwick, R.I.	9/24/71	

[1] Referred to local U.S. Attorney by EPA regional office.

Name	Location	Date Referred	Remarks
Vincennes Paper Mill Products Co.[1] (EPA Region V)	Vincennes, Ind.	11/1/71	Crim. suit filed 12/1/71; fined $500 on 6/30/72
Bevin Brothers Manufacturing Co.[1]	East Hampton, Conn.	11/24/71	
Tremont Nail Company [1]	Wareham, Mass.	11/29/71	
Amesbury Metal Products Company, Inc.[1]	Amesbury, Mass.	11/30/71	
Cambridge Tool and Manufacturing Co.[1]	North Billerica, Mass.	12/2/71	
Kay-Dee Feeds [1]	Sioux City, Iowa	11/29/71	Civil suit filed 9/1/72; consent decree filed 9/6/72
Monroe Auto [1]	Cozad, Neb.	11/9/71	
Keokuk Steel Company [1]	Keokuk, Iowa	11/17/71	
Cook Paint & Varnish Company [1]	Kansas City, Mo.	12/17/71	Consent decree pending
GAF Corporation [1]	Kansas City, Mo.	12/71	Pending
Oaks Sand & Gravel Company [1]	Nr. Redding, Calif.	9/17/71	On-site visit 5/72; discharge ceased; no leaching; not prosecuted; file closed
Mid-City Industrial Park [1]	Kansas City, Kan.	1/28/72	Indicted 4/14/72; consent decree in draft
National Beef Packing Corp.[1]	Kansas City, Kan.	1/21/72	Indicted 4/13/72; fined $1,000 on 5/72
Connecticut Hard Rubber Co.[1]	New Haven, Conn.	12/29/71	
Kulhman-Chennille Co.[1]	Adairsville, Ga.	1/25/72	
Mecklenberg County and Locker Plant [1]	Charlotte, S.C.	1/25/72	Criminal case filed 6/14/72
A. Leon Capel & Sons [1]	Troy, N.C.	1/25/72	Criminal case filed 4/11/72; fined $500 on 9/72
Pepsi-Cola [1]	Miami, Fla.	1/72	Criminal case filed 1/20/72; fined $6,750 on 3/4/72
Texfi Industries [1]	Mt. Gilliad, N.C.	1/25/72	Criminal case filed 4/11/72; fined $500 on 9/72
Tampa Soap & Chemical Company [1]	Tampa, Fla.	1/25/72	Criminal case filed 1/72
Safeway Stores [1]	Kansas City, Kan.	2/4/72	Prosecution declined; tied to city system
Wallace-Murray Corp.[1]	Rolla, Mo.	2/4/72	
Midwest International, Inc.[1]	Kellogg, Iowa	2/4/72	Fined $500 8/72
Carnation Milk [1]	Mt. Vernon, Mo.	2/4/72	Prosecution declined 6/26/62; abatement commitment to be secured
Midwest Cold Storage & Ice Company [1]	Kansas City, Kan.	2/3/72	Indicted 4/14/72; fined $500 8/4/72
Missouri Chemical Corp.[1]	St. Joseph, Mo.	2/2/72	Prosecution declined tied to city system
Wire Rope Corporation of America [1]	St. Joseph, Mo.	2/2/72	Consent judgmt & stipulation ent. 7/19/72
Inland Containers Corp.[1]	Fenton, Mo.	2/4/72	Pending [p. F–2]
Green Valley Chemical Corporation [1]	Creston, Iowa	2/4/72	Prosecution declined, permit applic. filed
Iowa Fund, Inc.[1]	Ankeny, Iowa	2/4/72	Pending
PPG, Inc.[1]	Crystal City, Mo.	2/9/72	Consent agreement 8/72, $2,500 in costs also assessed
C. F. Industries [1]	Hannibal, Mo.	2/9/72	
Esmond Machine Tool Co.[1]	Rhode Island	3/72	
Central States Paper and Bag Company	Palatka, Fla.	12/71	Pending in court
South Coast Construction Company & Park Lido Development Company	Newport, Calif.	3/23/72	Civil action filed 4/3/72 & temporary restraining order granted same day
E. M. Carter Packing Co.	Richland, N.C.	5/5/72	
Warren Brothers Company	Nashville, Tenn.	5/5/72	
North Carolina Consolidated Hide Company	Goldsboro, N.C.	5/5/72	
Clear Creek Coal Company	Monterey, Tenn.	5/16/72	
The Leisure Group	West Point, Miss.	5/19/72	
Mecklenburg County Abattoir	Charlotte, N.C.	5/24/72	Criminal suit filed 6/14/72
Lefler Concrete Block Company	Charlotte, N.C.	5/24/72	Criminal suit filed 6/15/72
Delmar Printing Company	Matthews, N.C.	5/24/72	Criminal suit filed 6/72 dismissed at EPA request
Chemical Leaman Tank Lines	Charlotte, N.C.	5/24/72	Criminal suit filed 6/15/72
Central Transport, Inc.	Charlotte. N.C.	5/24/72	Criminal suit filed 6/15/72
Snowco (Missouri River)	Omaha, Neb.	7/25/72	Fined $500 8/72
Clinton Engines (Maquoketa R.)	Maquoketa, Iowa	9/18/72	[p. F–3]

Appendix G

RECOMMENDATIONS OF WATER POLLUTION CONTROL ADVISORY BOARD

Animal Wastes

EPA Leadership in Animal Waste Pollution Control. It is recommended that EPA assume a vigorous leadership role in coordinating major activities of all Federal, State, and local agencies involved in agricultural waste management with those of educational institutions and private groups and individuals interested in solving animal waste disposal problems. To aid in this effort, EPA must be provided with more funds and expanded staffing to coordinate its own programs in research, training, administration, and management.

Agricultural Concerns. It is recommended that EPA join with the appropriate Federal and State agencies and educational institutions in developing and implementing a comprehensive public information program to explain fully the evolving guidelines and means of achieving effective pollution control measures necessitated by animal waste disposal problems, in recognition of the widespread concern among members of the agricultural community about new and changing requirements.

Financing Pollution Control. It is recommended that EPA seek added appropriations for expanded research and development programs so that costs to the farmer can be held to minimum levels. Demonstration projects are a very effective educational method that should be increased. In addition, USDA should use all existing programs and technical services to help animal producers install systems that comply with regulations.

Degree of Control. It is recommended that EPA encourage the adoption of State legislation and regulations for animal waste management based on minimal Federal guidelines that will maintain standards with a view to enhancing water quality.

Uses of Animal Wastes. It is recommended that EPA give high priority to funding for research and development projects that may develop practicable and safe alternate uses for animal wastes.

Public Health. It is recommended that EPA initiate cooperative long-range research projects that will result in the collection of reliable data on the possible but less evident ill effects of concentrations of animal wastes.

Monitoring. It is recommended that EPA, through program

grants or otherwise, encourage State agencies to increase their monitoring programs so that an adequate profile of State water quality by stream basins and groundwater would be available to easily identify problem areas.

Site Selection. It is recommended that attention be given to the development of national and/or State site selection guidelines that will determine the best land areas to be used for animal production to minimize water pollution.

Training. It is recommended that the Federal Government encourage educational institutions and State and local agencies, through grants and/or other incentives, to expand their graduate and undergraduate training programs in the environmental agricultural areas, and thus direct expert manpower into the pollution control field.

Uniformity. It is recommended that EPA develop animal waste guidelines and work as closely as possible with the States to ensure that these basic minimum requirements be adopted nationwide in the interest of uniformity that prevents discrimination against any particular group or individual.

Land Use

Relationship of Environmental Quality with Land Use Planning and Implementation. The Boards believe that means should be developed to bridge the gap between current land use decision-making and the national efforts to enhance and protect our environment.

Attitudes Toward Land Use. The need to maintain proper land use requires a reappraisal

[p. G–1]

of private and public land as a resource, as well as a commodity.

Coordination of and Between Federal Agencies. It is recommended that coordination between Federal agencies making land use decisions and other Federal agencies, especially EPA in its role as the Federal agency responsible for laws and standards in the areas of air quality, water quality, solid waste management, and noise. One method of accomplishing these ends is through formal interagency agreements between Federal entities involved in environmental issues.

Role of Federal, State, Regional and Local Government in Land Planning and Implementation. It is recommended that the Federal government provide:

- Land use guidelines including attention to:
  1. Environmental needs in the large, build-up metropolitan areas

2. The differential costs and benefits for different sectors of the population
3. Standards to guide State decision-making in an equitable treatment of those costs and benefits
4. The implementation of effective controls.

- Financial assistance to State and/or regional and local governments for developing and implementing comprehensive land use plans.
- Sanctions applied to States unwilling to carry out effective land use programming.

The States should provide criteria as well as financial and technical assistance to regional and local governments in their land management efforts.

The Environmental Protection Agency's Role in Land Use Planning. It is recommended that:

- EPA move purposefully to improve coordination with other Federal agencies whose activities affect or are affected by air and water quality standards; provide more environmental planning guidance to Federal, State, and local agencies together with close coordination and cooperation with local, regional, and State land use planners and policymakers; and make full use of present authority to affect land use decisions with respect to all environmental quality.
- The Presidents' Air and Water Quality Advisory Boards continue to assess and evaluate the complex relationships between land use and overall environmental quality, and that they define the role of EPA with respect to present land use planning and future possible regional land use policy.

Socio-Economic Considerations. It is recommended that:

- Federal policies and programs on standard setting, grants, contracts, and public works, regulation of and investments in Federally owned or controlled lands, and preparation and review of environmental impact statements take into consideration impacts upon population concentration, distribution of resources such as inter-basin water diversions, energy production and distribution, transportation systems, and locations of industrial plants and employment opportunities.
- A socio-economic impact statement covering the above

considerations be required as a companion to and equal in importance to present environmental impact statements. In this connection, the Federal agencies concerned should conduct studies of the cost-benefit advantages of such socio-economic planning and control devices (in contrast to the cost effectiveness of the installation of "end of the pipe" control technology).

Pending Legislation Concerning a National Land Use Policy. The Boards commend the President and the Administrator for their support of early enactment of legislation to establish a national land use policy. We believe it imperative that any such legislation be so structured as to require land use plans at all levels of government to be developed from the outset in a manner that will, as a minimum, ensure compliance with applicable environmental laws and standards, including air and water quality standards and implementation plans. In connection with such legislation, the Boards urge that consideration be given to means for direct support of land use planning by those large metropolitan areas that request such support, providing that the requesting agencies can [p. G–2]

demonstrate an ability to work within general guidelines consistent with national policies that are provided by the Federal government. If such legislation is enacted, we recommend that the Administrator make the resources of the EPA available to States and local governments to assist (1) in the formulation of land use plans to meet environmental objectives and (2) in the review of plans for the consistency with applicable laws before Federal approval.

Information and Education. It is recommended that:

1. The importance of environmental considerations as a part of the planning process be brought to the attention of appropriate officials at all levels of government.
2. An information program be directed toward the general public.
3. Methods be developed that will aid the planner in quantifying the environmental impact of his plan.
4. Better institutional arrangements be developed for decision-makers to participate in the planning process.

Development of Required Scientific Knowledge. It is recommended that the Federal Government and in particular the Administrator of EPA take those steps necessary to assure the development of plans for and the funding necessary to obtain

the new scientific knowledge required to determine strategies for dealing with the preservation of our environment.

Ocean Disposal

Legislation. It is recommended that:

- Congress enact immediately the Marine Protection Research and Sanctuaries Act of 1972 (Ocean Dumping Bill).
- The apparent duplication of responsibilities in EPA and the Department of Commerce for research and monitoring be eliminated and all responsibilities for establishment and enforcement of marine water quality criteria and associated research and monitoring activities be centered in EPA.
- Congress enact immediately the proposed 1972 amendments to the FWPCA as reported by the Joint Senate-House Conference Committee.
- EPA seek remedial legislation to require the establishment of Federal water quality standards for waters in the contiguous coastal zone located between the 3-mile and 12-mile off-shore lines.

Toxic Substances. It is recommended that EPA press for a requirement that all industrial wastes containing significant amounts of toxic substances, including heavy metals, be pretreated for the removal of such substances before being discharged to municipal sewage systems.

Incinerators. It is recommended that EPA actively pursue the development of more accurate emission measuring equipment, so as to provide adequate assurance that sewage sludge incinerators do not pose unacceptable threats to human health or air quality.

Scientific Data. It is recommended that an inventory of the ocean bottom and the coastal waters of the United States and its territories be completed without delay in order to establish baseline data to which future comparisons can be referred. The inventory, or baseline data, should include but not be limited to the subsurface and bottom ocean currents, upwelling, temperatures and chemical composition of the waters, seasonal changes, distribution of existing aquatic life food chains, and aquatic migration patterns.

It is further recommended that EPA take the lead and in cooperation with the National Oceanic and Atmospheric Administration, the Corps of Engineers, Coast Guard and other interested

agencies plan and conduct a program of research and monitoring that will lead to improvement of marine water quality criteria, selection and use of ocean dumping sites, provision of guidelines for proposed disposal operations, and assurance of nondegradation and enhancement of the environmental quality of the oceans.

Sludge Disposal on Land. It is recommended that where available Federal or State lands of relatively low value be utilized for experimental sludge-spreading programs.

Dredge Spoils. It is recommended that, where [p. G–3] possible or feasible, dredge spoils should be used to fill coastal land development areas. The Board suggests cost-benefit studies be employed to certain the value of environmental enhancement resulting from containment versus dumping of dredge spoil. Studies should also be undertaken to determine the feasibility of treating dredge spoils before ocean disposal to remove solids and other components that might be deleterious to the ecosystems.

Nutrient-Rich Wastes. It is recommended that the Federal government's research activities include efforts to explore more fully those conditions under which nutrient-rich wastes can be effectively utilized to improve the marine environment.

Regional Standards. It is recommended that the Federal government continue to insist on regional approaches and insure consistency in the application of standards of treatment, disposal, and controlled dumping procedures applicable to all State and local agencies in the coastal regions and/or on the river or estuarine system. Separate regional standards must be applied where divergent coastal conditions exist.

Shoreline Protection. It is recommended that State governments intensify their efforts to enhance the quality of their own shoreline and not depend solely on Federal legislation. Federal encouragement of, and priority cooperation with all such States, should hasten the time otherwise required to correct the current abuse of the Nation's coastal waters.

Raw Sewage. It is recommended that the construction of facilities to end the unacceptable practice of discharging raw sewage into any harbor is mandatory. While the Board cannot condone years of failure to comply with acceptable health and welfare standards, it recognized that funds available to cities have been limited. The Board urges that the construction of sewage treatment plants with sludge digestion be given priority.

Federal assistance for such plants must be contingent on EPA approval of the ultimate method of sludge disposal to assure nonviolation of environmental protection regulations—whether disposal is through incineration, marine disposal, land disposal, or other means.

In the absence of an immediate solution to the present practice of raw sewage discharge, a moratorium on new building construction should be enforced to the extent that increased raw sewage discharges and overloading of sewers and treatment plants will not occur. [p. G–4]

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