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# REPORT TO THE CONGRESS

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GENERAL ACCOUNTING OFFICE

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## Factors To Be Considered In Setting Future Policy For Use Of Inland Waterways

Since 1950 tonnage transported on the Nation's inland waterways--built and maintained with Federal funds--has doubled and the ton-miles have increased almost fivefold. Although the inland waterways include less than 3 percent of the miles in the Nation's transportation system, they account for 11 percent of the total ton-miles of all commodity movements.

Although considerable Federal funds have been spent on the inland waterways, the Government has permitted their free use for commerce and recreation. Now waterways traffic volume has reached a point where relatively nominal user charges would recover the annual operating costs. The Congress will need to decide whether to continue that policy in considering the President's proposal for imposition of waterways user charges.

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COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

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To the President of the Senate and the  
Speaker of the House of Representatives

This report presents factors which, it seems to us, the Congress will need to consider in establishing a national policy for funding inland waterways improvements and operations and in considering proposals for imposition of waterways user charges.

We made our review pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Director, Office of Management and Budget, and to the Secretaries of Defense, the Army, Commerce, and Transportation.

*Thomas B. Staats*  
Comptroller General  
of the United States



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Comptroller General  
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ABBREVIATIONS

ICC	Interstate Commerce Commission
O&M	operation and maintenance
WRC	Water Resources Council

D I G E S T

The Federal Government has financed virtually the entire cost of developing and maintaining the Nation's inland waterways. In deciding whether to continue that policy and in considering the President's proposal for imposing waterways user charges, the Congress will need to consider the policy's effect on

- waterways commerce,
- competing modes of transportation,
- the environment of increasing traffic, and
- energy consumption of shifting traffic among competing modes of transportation.

Although considerable Federal funds have been spent on the inland waterways, the Federal Government has always permitted their free use for commerce and recreation. This free use has proven to be extremely effective, resulting in a rapid and vast development of the water transportation industry.

Waterways use has expanded to the point where existing key lock capacities have become inadequate to handle all traffic and barges must wait idly for long periods, resulting in severe losses of productive time. Further growth of waterways industry, augmented by Federal subsidies, will intensify congestion and increase the loss of productive time. (See p. 5.)

Expanded use of the rivers for commercial traffic is meeting serious objections by environmental groups. They particularly oppose projects designed to enlarge waterways capacities. (See p. 8.)

Since 1950 the tonnage transported on the inland waterways has doubled and the ton-miles

have increased almost fivefold. Although the inland waterways include less than 3 percent of the miles in the Nation's transportation system, they account for 11 percent of the total ton-miles of all commodity movements. Waterways traffic volume has reached a point where relatively nominal user charges would recover the annual operating costs.

For example, a fuel tax of about 7 cents a gallon in 1973 would have fully absorbed the \$109 million waterways operation and maintenance expense the Corps of Engineers incurred. For commercial users, this fuel tax would have increased their total operating cost by about 4 percent. (See p. 19.)

In November 1974 President Ford recommended legislation providing for recovering waterways operation and maintenance costs. In September 1975 the Secretary of Transportation advocated a system of user charges. (See p. 3.)

Recreational users pay Federal and State highway fuel taxes averaging about 12 cents a gallon. Many States permit these users to recover these taxes, but not all users apply for refunds. Federal laws permit users to recover 2 cents of the 4-cent Federal tax paid, but again, not all users apply for refunds. Although the Corps waterways maintenance program does not benefit from the taxes collected, the users, in effect, are paying waterways user charges. (See p. 21.)

New Corps river maintenance duties have developed, resulting in new costs. Dredged spoil, which once could be deposited on the nearest river bank, in the future may have to be transported to selected deposit sites. This requirement is expected to increase dredging costs drastically. (See p. 12.)

Analyses by waterways user groups and Government agencies showed that diversion of traffic from the waterways would be sharp if increases in barge rates were to exceed 25 percent. If shipping rate increases were kept below 10 percent--an amount sufficient to cover Corps operation and maintenance costs--a

relatively minimal impact could be expected. Shippers and carriers that GAO interviewed did not foresee that a 10-percent increase in shipping costs would result in considerable traffic diversion from the waterways. (See p. 14.)

If waterways carriers were assessed user charges, all or a large part of the costs probably would be passed on to shippers or receivers, causing some to seek alternative shipping modes. Analyses indicate that, although the waterways industry may suffer by the loss of business, other favorable effects could be expected, such as

--a relief of congestion on the waterways at key locks,

--a lessening of growing detrimental effects on the environment, and

--some limited potential for energy savings and more efficient transportation under certain conditions from diversions of traffic to pipelines and railroads. (See pp. 14, 22, and 23.)

1012 The Departments of Transportation, Commerce, and the Army generally took the position that GAO had not adequately shown the total economic impact of user charges and had failed to show the adverse environmental impact of alternative methods of transportation. GAO recognizes that the information obtained for this study does not provide an adequate basis for making firm conclusions, but it does identify factors which need to be considered in setting future policy for use of the inland waterways. (See p. 24.)

## CHAPTER 1

### INLAND WATERWAYS USE POLICY--ORIGIN AND EVOLUTION

Historically the Federal Government has financed virtually the entire cost of developing and maintaining inland waterways through taxes on the general public. This contrasts sharply with highway development where Federal and many State and local government costs are recovered through user charges and with railroads where the Federal Government's land grants were repaid through tariff reductions and current rail operation and maintenance (O&M) costs are mainly recovered by the industry itself. The result has been a major subsidy for waterborne commerce. In deciding whether to continue that policy, the Congress should consider the policy's effect on:

- Waterways commerce.
- Competing modes of transportation and on the overall efficiency of resource allocation in the transportation sector of the economy.
- The environment of increasing the volume of commerce and of measures required to accommodate such an increase.
- Energy consumption of shifting traffic among competing modes of transportation.

The inland waterways had their beginning early in the 1800s when the paramount objective of providing federally assisted transportation was to encourage settlement and economic development of the vast undeveloped reaches of the Nation. Since 1824 the U.S. Army Corps of Engineers has been responsible for planning, constructing, operating, and maintaining the inland waterways system. Regional demand for waterways improvement projects was strong late in the 1800s and early in the 1900s, because it was claimed that low-cost water transportation would stimulate economic development and would lead to reducing railroad freight rates.

The first period of commerce on the waterways system began with colonial settlement and extended to the Civil War. During that period the rivers were used in their natural condition with little investment of public funds. From the Civil War until early in the 1920s, when a towboat and barge industry began to emerge, the railroads completely dominated the transportation field.

Since 1950, after a period of relatively slow and unprofitable growth, the barge industry has enjoyed rapid growth and profit. Cargo tonnage has doubled, and the ton-miles have increased almost fivefold. Since 1960 the industry's investment and percentage of return on total investment have nearly doubled and carriers' revenues have gone up more than 120 percent. The industry now uses over 4,000 towboats and 20,000 barges. The barges have a total cargo-carrying capacity equivalent to about 500,000 standard railroad boxcars.

Because of its low operating cost, the barge industry has a competitive advantage in high-volume movements of low-value bulk goods. For this reason, two-thirds of the inland waterways traffic is made up of five bulk commodities: coal, petroleum and petroleum products, agricultural products, iron and steel, and chemicals.

Water carriers that transport certain manufactured and packaged products are subject to regulation by the Interstate Commerce Commission (ICC). Bulk-commodity carriers and private carriers are exempt from regulation. In 1972 ICC regulated about 8 percent of domestic waterways shipments. About 180, or 10 percent, of 1,850 waterways carriers<sup>1</sup> had ICC authority to transport regulated commodities. The other 90 percent either were engaged in private carriage or handled only bulk shipments. Although barge rates are often published for these bulk shipments, ICC has no regulatory authority and the carrier has complete freedom in charging for its services.

Construction of the Nation's inland waterways has required over \$3 billion of Federal funds. The system today consists of over 25,000 miles of waterways, including about 15,000 miles of commercially navigable segments having depths of 9 feet or greater and 227 locks. (See app. VI.) The O&M costs of the waterways now exceed \$100 million a year. (Operating details of the inland waterways are shown in app. V.)

None of the waterways' construction or annual O&M costs have ever been reimbursed by waterways users in that there has been a longstanding policy of free use dating back to the Northwest Ordinance of 1787, which stated, in article IV, that:

"The navigable waters leading into the Mississippi and St. Lawrence, and the carrying places between

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<sup>1</sup>"Domestic Waterborne Shipping Market Analysis," A. T. Kearney, Inc., Feb. 1974.

the same, shall be common highways and forever free \* \* \* to citizens of the United States \* \* \* without any tax, impost or duty therefore."

This policy was reiterated by the Congress in the Rivers and Harbors Act of August 2, 1882, as amended (33 U.S.C. 5), which prohibits collecting tolls for the use of "any canal or other improvement of navigation belonging to the United States."

Presidents and some Members of Congress for many years have advocated waterways user charges. All recommendations for user charges were based on the enactment of legislation which would require partial or full recovery of Federal expenditures for developing, operating, and maintaining the waterways.

Presidents Franklin D. Roosevelt, Dwight D. Eisenhower, John F. Kennedy, and Lyndon B. Johnson recommended recovery of all or part of O&M expenditures. President Roosevelt also recommended partial recovery of capital improvements costs. Presidents Harry F. Truman, Eisenhower, and Richard M. Nixon received recommendations from various presidential commissions and cabinet secretaries calling for partial or complete recovery of O&M costs and partial or complete recovery of construction costs. In 1961 Congressman James E. Van Zandt of Pennsylvania and Senator James G. Beall of Maryland introduced bills calling for recovery of O&M costs plus costs of future and existing capital improvements.

In his November 1974 message to the Congress, President Gerald R. Ford recommended legislation providing for recovering O&M costs, and in July 1975 a bill (H.R. 8590) was introduced which would provide for a waterways user tax and locking fees. In his September 1975 statement of national transportation policy, the Secretary of Transportation advocated a system of user charges through which identifiable beneficiaries of federally improved and maintained waterways would bear some share of the development and operating costs.

The Water Resources Planning Act of 1965 (49 U.S.C. 1656) directed the United States Water Resource Council (WRC) to establish principles and standards for guiding Federal participation in planning the use of the Nation's water and related land resources. The principles and standards which WRC developed and which the President approved became effective October 1973. One of the principles and standards provides that:

"Reimbursement and cost-sharing policies shall be directed generally to the end that identifiable

beneficiaries bear an equitable share of cost commensurate with beneficial effects received."

Section 80 of the Water Resources Development Act of 1974 (Public Law 93-251) directs that the President make a 1-year study of principles and standards for planning and evaluating water and related resource projects. One of the study's objectives is to determine appropriate Federal and non-Federal cost sharing for water resource projects. Responsibility for the study was assigned to WRC late in 1974, and the study is expected to be completed in 1975.

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We are not making any recommendations at this time, but we are presenting information on matters which the Congress will need to consider in establishing a national policy for funding inland waterways improvements and operations and in considering the President's proposal for imposing waterways user charges.

## CHAPTER 2

### TODAY'S WATERWAYS CONDITIONS ARE VASTLY DIFFERENT FROM THOSE IN EARLY YEARS

Major developments affecting the operation of the inland waterways have occurred gradually over the past century, culminating in conditions today vastly different from those that existed in the early years.

Waterways industry expansion has reached a point where some main waterways arteries are becoming overcrowded. Existing lock capacities at key locations are becoming inadequate to handle all traffic. Barges must wait idly at crowded locks for long periods, resulting in severe losses of productive time. Expanding waterways to adequately accommodate added growth will not only be extremely costly but may have a detrimental environmental impact.

Continuing Federal waterways subsidies will promote further growth of the waterways industry. For certain waterways segments, however, continued industry growth will increase congestion, contributing to a situation of regressive productivity.

These developments indicate a need to consider altering the present waterways policy.

#### CAPACITY AT KEY LOCATIONS BECOMING INADEQUATE TO HANDLE TRAFFIC

Although considerable Federal funds have been spent to develop and maintain inland waterways, the Federal Government has always permitted free use of the waterways for commerce and recreation. This free use has resulted in a rapid and vast development of the water transportation industry as a valuable asset to the Nation's productivity. Although accounting for only 2 percent of the national freight cost, waterborne commerce handles 16 percent of the total freight. The table below shows the growth of the industry.

### Traffic transported on inland waterways

<u>Year</u>	<u>Net tons</u>	<u>Ton-miles</u>
	(000,000 omitted)	
1940	183	22,412
1950	298	51,657
1955	363	97,663
1960	395	120,784
1965	472	152,812
1970	554	204,085
1973	596	232,308

The inland waterways system accounts for about 2 percent of the surface route miles in the Nation's transportation system. The railroads--the barges' principal competitor--have constructed and operate eight times as many route miles yet transport only three times as many ton-miles of intercity freight. Since 1950 the barge tonnage has doubled and the ton-miles have increased almost fivefold. This rapid growth has strained the capability of the waterways system to handle the traffic.

Corps data shows that existing lock facilities at key locations are becoming inadequate to handle traffic promptly and that therefore user costs are increasing. Capacity constraints on the waterways first appear at the locks where towboats and barges are delayed. Because towboat-operating expenses continue, even though there is no productivity, delays are costly to carriers. Although some waiting time is inevitable at even uncrowded waterways, the average waiting time for lockage escalates sharply as traffic congestion increases. Corps data shows that traffic congestion has grown to proportions that are at or near the capacity of several locks on the Illinois and upper Mississippi Rivers.

#### Locking policy and capacity criteria

Passage of both recreational and commercial vessels through the locks generally is on a first-come-first-served basis. The Corps does not give service priority to large tows over small tows or to full tows over empty tows. Neither does the Corps regulate or otherwise attempt to suppress traffic when the locks are overcrowded.

#### Examples of capacity problems

The Corps North Central and Lower Mississippi Valley Divisions have, in past studies, defined lock capacity as the occurrence, in any given month, of average tow delays in excess of 150 minutes.

Corps records showed that for the month of October 1974 the average delay at the seven locks on the Illinois

River was 144 minutes and that at three of the seven locks the criterion average delay of 150 minutes was exceeded. The table below shows the designed capacity and transiting tonnage for 1970 and estimated tonnage for 1980, 1990, and 2000 for each of the seven Illinois River locks.

<u>Lock</u>	<u>Designed capacity</u>	Transiting	<u>Estimated tonnage</u>		
		<u>tonnage 1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
(million tons)					
Lockport	22.4	22.9	32.0	37.5	43.1
Brandon Road	23.1	23.5	30.6	37.9	45.1
Dresden Island	33.1	25.3	33.2	42.1	49.6
Marseilles	29.7	24.2	30.8	41.0	47.3
Starved Rock	42.6	25.5	31.8	41.8	48.2
Peoria	54.2	29.0	40.1	51.9	63.2
LaGrange	52.1	26.1	37.9	49.2	62.6

Two of the locks operated above their designed capacity in 1970. Two more will exceed their designed capacity by 1980, and estimated traffic will surpass the designed capacity of all the locks in the 1990s.

Traffic at 3 of the 28 locks on the upper Mississippi River has exceeded, or is expected by the Corps to exceed, the designed capacities before 1980 and traffic at 3 other locks is expected to exceed the designed capacities in the 1980s.

#### Cost of delays

At lock 26 on the upper Mississippi River at Alton, Illinois, where traffic of the lower Mississippi River interchanges with both the Illinois and the upper Mississippi Rivers, the volume of traffic has exceeded the lock's capacity for several years. As a result, barge traffic is required to wait for passage at virtually all times throughout the year. Waiting periods of more than 12 hours are not uncommon. According to the Corps records, the total accumulated waiting time during 1974 exceeded 39,000 hours and averaged about 4-½ hours for each tow passage.

On the basis of a Department of Commerce cost estimate of \$150 an hour for towing operations, the barge industry incurred additional costs of nearly \$6 million in 1974 because of delays at this one location. Also the Corps reported that the accumulated waiting time at the seven locks on the Illinois River during 1974 totaled about 83,000 hours. The

estimated cost to the barge industry for these delays totaled about \$12.5 million. Delays also occurred in 1974 at locks on the upper Mississippi and Ohio Rivers, but records of the waiting times were not kept.

#### Waterways expansion costly to Federal Government

The Corps believes the inland waterways should be improved or expanded to handle the increasing traffic volume. Modifications to provide the needed increases in the waterways capacities, according to Corps studies, are feasible but costly. Although the Corps does not have cost estimates for the entire system, it estimates the improvements at lock 26<sup>1</sup> on the upper Mississippi River will cost about \$425 million and at locks on the Illinois River will cost \$654 million.<sup>2</sup> A photograph of existing lock 26 and a drawing of the planned replacement are on pages 9 and 10, respectively. Other improvements already underway are estimated to cost about \$2.4 billion.<sup>3</sup> Also the Corps estimates that additional improvements costing \$3.3 billion will be needed before 1985, to provide the capacity to handle expected low-sulphur-coal shipments.<sup>3</sup> Thus the total cost of improvements to the system in the Mississippi, Illinois, and Ohio Rivers to adequately accommodate added growth of the waterways transportation industry is estimated to be at least \$6.7 billion.

#### COMMERCIAL USE OF WATERWAYS MAY INCREASE DETRIMENTAL IMPACT ON ENVIRONMENT

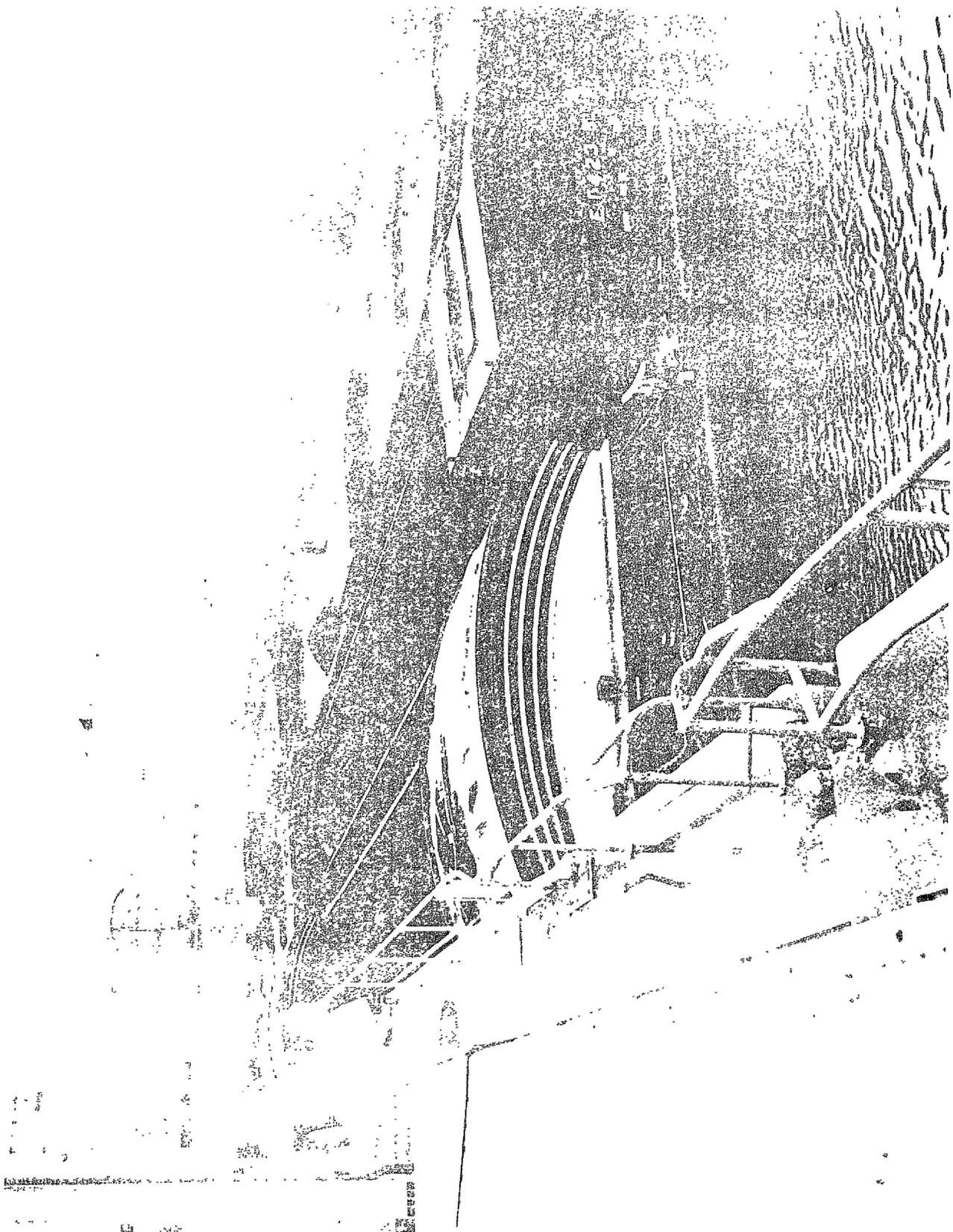
Public agencies--such as the Environmental Protection Agency and the Fish and Wildlife Service of the Department of the Interior--and private organizations--such as the Sierra Club and the Izaak Walton League--agree that commercial use of the inland waterways has had an undesirable effect on the environment and that planned expansion of the systems' capacity to handle increased traffic could produce additional, unacceptable harm. Although commercial use of the waterways has a detrimental effect on the environment, we did not make an analysis to determine whether diversion of existing or future waterways traffic to other transportation modes would lessen the impact on the environment.

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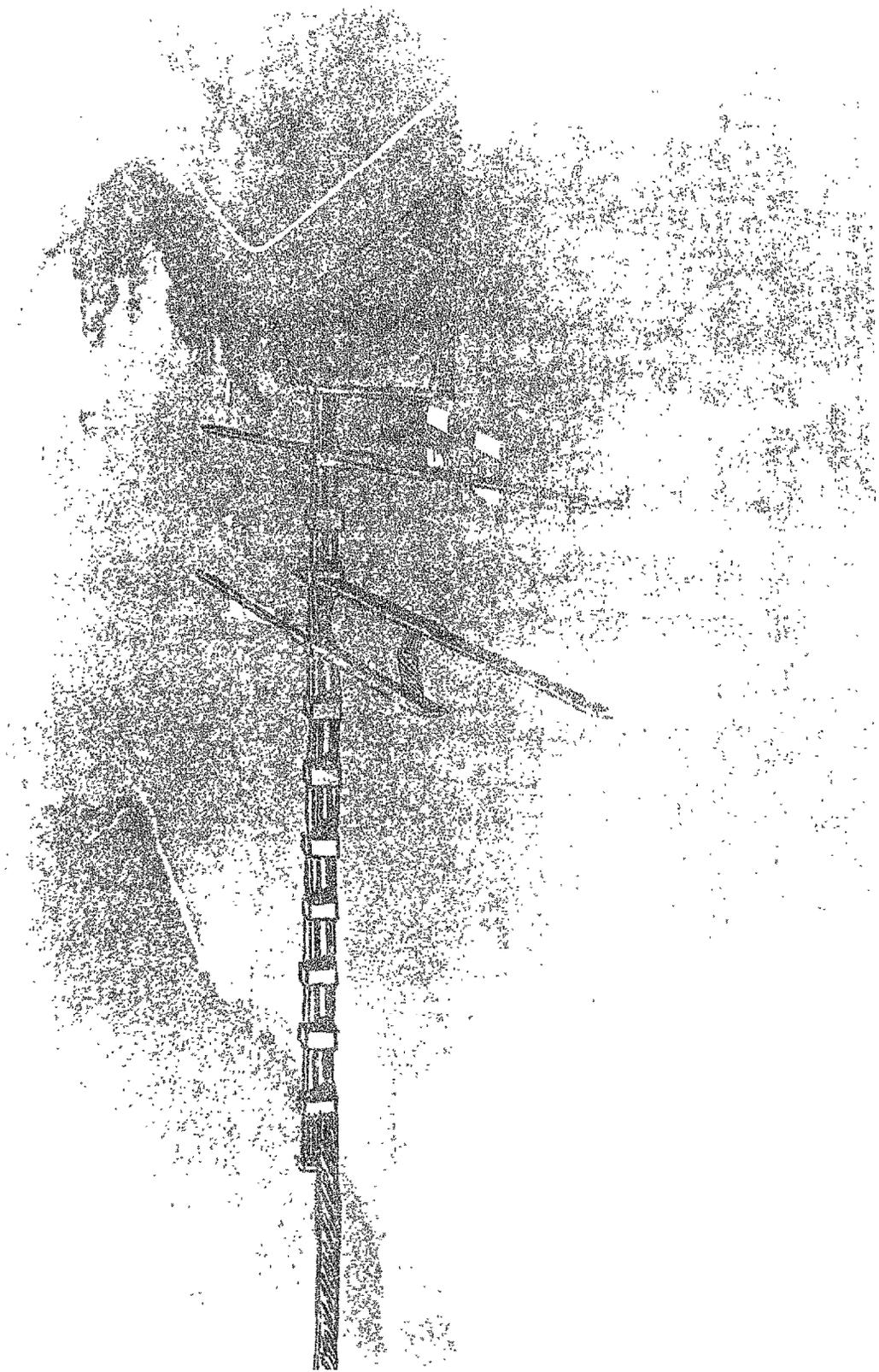
<sup>1</sup>Corps of Engineers, Civil Works Division, July 1974.

<sup>2</sup>"Upper Mississippi River Comprehensive Basin Study," vol. V, app. J, U.S. Army Engineering Division, North Central, 1970.

<sup>3</sup>"Project Independence," vol. I, Federal Energy Administration, Nov. 1974.



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The environmental impact will differ, depending on whether (1) the inland waterways are to be operated at their present traffic levels or (2) traffic volume is greatly increased by installing larger or additional locks and/or by increasing channel depths.

The Corps, before enlarging the inland waterways' capacity, would need to prepare an environmental impact statement, in compliance with the National Environmental Policy Act of 1969. Section 102 of the act specifies that environmental impact statements cover these five points.

- The environmental impact of a proposed action.
- Any adverse environmental effects which cannot be avoided should the proposal be implemented.
- Alternatives to the proposed action.
- The relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity.
- Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

#### Environmental impact of existing system

One of the paramount concerns of the environmentalists is the probability of the upper Mississippi, Ohio, and Illinois Rivers and other parts of the waterways system becoming so polluted that they become unsuitable for wildlife, fish, and recreation.

Although barges generally have a good safety record, they often carry highly pollutive chemicals which, if accidentally discharged, would severely damage large water areas; less serious cargo spills often happen when barges are being loaded, unloaded, or cleaned. However, a transportation study<sup>1</sup> made for the Department of Commerce in 1974 showed that the relative human exposure to hazardous substances shipped entirely by one mode was least for barge shipments, although truck shipments were a close second. Although the

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<sup>1</sup>"A Modal Economic and Safety Analysis of the Transportation of Hazardous Substances in Bulk," Arthur D. Little, Inc., July 1974.

barge industry is apparently better regulated from a safety standpoint than either the truck or the rail industry, the study concluded that the possibility of accidental discharge of hazardous substances into water was much greater for barge shipments than for the other modes of shipment, but this possibility must, in most instances, be balanced against the smaller risk to people and property than would result from other modes.

Environmentalists contend that towboat and barge wakes and boat-propeller washes have harmful biological effects, erode shorelines, and disturb bottom material. As a result, the growth of suspended and bottom-dwelling microscopic plants and animals, which are used as food by fish and which are essential to the aquatic food chain, is inhibited.

Environmental problems become greater when backwater sloughs do not receive adequate water circulation because the main channel is blocked by parked barges awaiting assemblage or fleeting service or is blocked by spoil from maintenance dredging. This leads to oxygen deficiencies and high concentrations of nitrates and phosphates, which make the water unsuitable for fish.

Maintaining the 9-foot channel on the upper Mississippi River from Guttenberg, Iowa, to Minneapolis, Minnesota, a distance of about 250 miles, requires removing about 2 million cubic yards of sediment annually. This material (spoil) usually has been deposited at the river's edge. The Corps agrees that this practice is environmentally harmful but estimates that alternative methods of spoil disposal would raise the cost of maintenance dredging on this stretch of the river from about \$740,000 to as much as \$8 million annually.

#### Environmental impact of increasing traffic volume through lock construction

Environmentalists believe the construction of larger or additional locks to accommodate increased traffic would basically accentuate those detrimental environmental aspects associated with the present system; that is, higher traffic density would increase the likelihood of barge accidents and cargo spills, with the attendant pollution of the river waters. According to environmentalists, turbidity (sediment in suspension) would increase because more and larger tows would cause greater bank erosion and the increased number of more powerful towboats would increase the resuspension of sediment. This, in turn, would require additional dredging

each year at additional costs. If spoil is deposited in wooded areas, the forest cover could be lost. Greater congestion in port areas would lead to more barges blocking backwater sloughs while awaiting fleeting service.

An additional impact of paramount importance, according to some environmentalists, is that increased traffic could have a devastating effect on many animals, fish, and birds protected by the Endangered Species Act of 1973 (Public Law 93-205).

Environmental impact of increasing traffic volume through channel deepening

Environmentalists are opposed to increasing channel depths either by dredging the channel bottom or by raising water levels. Although the environmental impacts have not been fully studied or determined, an official of the Fish and Wildlife Service said that deepening the channels in the Mississippi River would contribute to a "tremendous potential for wide-scale destruction of the natural environment."

According to environmentalists, all the detrimental aspects caused by additional lock construction would be markedly intensified by the deepening of channels. They contend that construction and maintenance dredging would have an adverse impact on water quality and that enormous quantities of spoil would either block the flow to many backwater channels or be very costly to transport to remote sites.

Environmentalists believe that, if water levels were raised, woodland and wildlife habitat would be lost. They also point out that increased water depths, no matter how produced, would further limit sunlight penetration. They contend that this, coupled with the increased turbidity from traffic flow, would reduce the photosynthetic process and cause a rapid degradation in fish habitat and waterfowl feeding grounds as oxygen levels diminish.

## CHAPTER 3

### USER CHARGES IMPACT ON INLAND

#### WATERWAYS AS A TRANSPORTATION MODE

Studies and analyses by waterways user groups and Government agencies of the impact of user charges on the waterways industry generally indicated that user charges assessed to carriers would be passed on to shippers and, in turn, to producers or consumers. These studies showed that the increased cost would result in some shifting of traffic from waterways to other shipping modes but that such shifting would be small if the user charges were not more than 10 percent of barging rates.

Most proposals for user charges have called for full or partial recovery of waterways O&M costs. Relative nominal user charges--equivalent to 5 percent of commercial users' operating costs--would allow recovery of the Corps annual operating costs.

From a national vantage point, some favorable impacts may accrue from user charges. User charges may tend to result in slowing down the growth of waterways traffic, lessening the growing detrimental effects on the environment, and relieving overcrowding on segments of the waterways. Diverting traffic from waterways to pipelines or railroads, resulting from the imposition of waterways user charges, has some potential for energy savings and more efficient transportation. This potential, however, is rather limited and does not appear to be a major factor in establishing user charges.

#### USER CHARGES IMPACT ON WATERWAYS TRAFFIC

In the past, estimates by waterways user groups and by Government agencies of waterways traffic diversion that could be expected to result from higher barge rates have varied. According to these sources, diversion could be sharp, up to 33 percent, if increases in barge rates were to exceed 25 percent. Many such increases would bring barge rates near, or higher than, existing rail rates.

If user charges were kept at a rate that would not exceed 10 percent of existing barge rates--a rate sufficient to recover the waterways' 1973 O&M costs--some traffic diversion could be expected. A 1973 study<sup>1</sup> by a Federal

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<sup>1</sup>Report on cost sharing for water resources investments, Aug. 1973.

interdepartmental task force estimated that a 5-percent diversion could be expected if a 4-cent-a-gallon fuel tax were imposed.

Most inland waterways shippers and carriers that we interviewed in 1974 and 1975 did not foresee that a 10-percent increase in barge rates would result in any major diversion of traffic from the waterways. These shippers and carriers felt that some, but only relatively minor, diversion could be expected for principal commodities shipped.

#### Petroleum and petroleum products

Petroleum and petroleum products represent the largest product volume shipped on the inland waterways. In 1973 shipments were 228 million tons, or about 40 percent of the total waterways commerce. Barge transportation accounted for about 12.5 percent of the 1.8 billion tons of petroleum and petroleum products shipped by all transportation modes.

A 10-percent increase in barge rates presents a potential for some diversion to pipelines but little diversion to railroads. Petroleum product shipments might be diverted to pipelines if there were an existing pipeline operating under capacity or if the demand were sufficient to warrant construction of a new pipeline.

An official of a refinery that used barges extensively reported that a 10-percent increase in barge rates would have no effect on the refinery's operations but that the refinery would consider pipelines as an alternative if the increase approached 25 percent. A petroleum distributor which transported crude and refined products about 700 miles by barge reported that rail rates were about 100 percent higher than barge rates. This firm owned and operated barges. Another independent gasoline distributor reported that a 10-percent increase in barge rates might lead to a loss of some markets to competitors served by pipelines.

An official of a larger petroleum firm told us that there had been a gradual shift from barge to pipeline in recent years due to cost-saving advantages and that waterways user charges would tend to continue, or even accelerate, this shift. He said, however, that future shifting, although it could not be readily estimated, would be limited because of the capacity of pipelines and because not all markets have pipeline access.

## Coal

Bituminous coal and lignite represent about 20 percent of the total tonnage of inland waterways shipments. In 1973 coal and lignite shipments totaled 117 million tons. Almost 80 percent of coal movement is by rail. Water transport, however, is almost always used if the production source is near a navigable waterway and if the consumer can be reached by water transport.

Some coal and power companies operate barges. Executives of one large coal-mining firm delivering about one-third of its annual production by waterways indicated that a 10-percent increase in barge rates would have no effect on the firm's transportation pattern. They said that the spread between barge and rail rates would continue to make barges the lower cost option. They said also that many of the firm's utility customers were located on the waterways and could handle only waterborne deliveries.

Management personnel of three large electric utilities indicated that diversion from the delivery mode they used was unlikely. One company could supply over 40 percent of its power-generating plants only by barge because they could not be reached by rail. At other plants where coal could be delivered by either barge or rail, the railroads were not closely competitive with the barges and little diversion would be expected from the imposition of user charges. Officials of another utility company, which received all of its coal by barge, did not expect any diversionary effect as the result of user charges even though rail facilities were available at some locations.

A coke producer that received about 90 percent of its inbound coal shipments by barge said that there would be no diversion if barge rates were increased 10 percent, because there currently was a spread of 20 to 25 percent between barge and rail rates. He said that an increase in barge rates might encourage the railroads to lower their rates in order to better compete with barges.

A coal industry economist said he believed there would be no diversion of coal to other means of transport if user charges were levied in that every mode was needed to its fullest potential. He pointed out that various studies projected a 40- to 65-percent increase in the tons of coal to be transported by barge in 1985 if a national goal of energy self-sufficiency were to be pursued. He said similar percentage increases would occur for coal transported by other modes.

## Chemicals and chemical products

Chemicals and chemical products make up about 9 percent of the tonnage shipped on the inland waterways. Major groupings include basic chemicals, chemical products, sodium hydroxide, fertilizers, benzene, toluene, alcohols, and liquefied gases. In the aggregate, over 50 million tons of these materials were transported by barge on the inland waterways in 1973. Much of this tonnage originated in producing centers on the gulf coast, and major movements were on the Mississippi, Ohio, and Illinois Rivers en route to consuming and processing centers.

A transportation study<sup>1</sup> made for the Department of Commerce in 1974 showed that, for nine selected chemicals, shipped between several different city pairs, the average transportation costs by rail would be almost three times those by barge. This spread, coupled with the fact that much of the chemical industry is located near waterways facilities, makes diversion improbable.

## Agriculture products

Grain, soybeans, and grain products account for about 6 percent of the total tonnage of inland waterways shipments. In 1973 shipments of these agriculture products amounted to 35 million tons. Although barges handle only 20 percent of the tonnage movements, barge shipments represent about 30 percent on a ton-mile basis.

Executives of a large grain-merchandising operation reported that, because barge rates from Minneapolis to the gulf coast were considerably lower than rail rates, they could foresee no diversion from the barges resulting from a moderate increase in rates.

Shippers found, however, that, from points further south, an increase in barge rates would result in some immediate diversion to rail. They said that, from points in Iowa, Illinois, and Missouri--except for producing areas nearer to the Mississippi River ports where products moved by motor carrier to river ports for transshipment by barge--rail rates for unit trains had been competitive to barge rates to the gulf coast. They pointed out that an increase in barge rates would tend to make barge rates less competitive with rail rates in these areas.

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<sup>1</sup>"A Modal Economic and Safety Analysis of the Transportation of Hazardous Substances in Bulk," Arthur D. Little, Inc., July 1974.

For example, at certain points located about 100 miles from the river, the cost of grain shipments in 1974 to the gulf coast was 30.5 cents a bushel by unit trains. The cost of grain shipments by truck from these points to the nearest river port was 14 cents a bushel and by barge from there to the gulf coast was an additional 16 cents a bushel. Therefore any increase in barge rates would shorten the economical trucking distance and lead to some diversion to rail. An Iowa State Commerce Commission official told us he favored diversion to rail because it would lead to less heavy-truck carriage of grain and hence less highway damage.

A study of grain distribution patterns,<sup>1</sup> made for the Department of Transportation, showed that, if barge rates were increased by 10 percent, an improved, more efficient transportation system would result. The increase would result in some shifting from combined truck-barge shipments to more direct rail shipments and thus in a reduction of the number of ton-miles transported. The study further showed that the emerging distribution pattern would be a more cost-efficient system because the resulting overall transportation costs, exclusive of user charges, would be reduced.

### Steel

Tonnage shipped on the inland waterways by the steel industry has increased by about 75 percent during the past decade. In 1973 the tonnage was about 45 million tons, or about 8 percent of the total waterways shipments. Waterways shipments of manufactured iron and steel products, which are subject to ICC tariff regulation, totaled only 7 million tons, or about 16 percent of the industry's waterways shipments. The remainder, which are exempt from ICC tariff regulation, were made up of lower value bulk products, such as iron ore and scrap iron.

A processor of structural steel for the building trades said that, although barge rates were considerably lower than rail rates, he preferred using rail because its faster service resulted in lower inventory-carrying costs. He said also that, in many cases, rail shipments could be made directly to a construction site, whereas barge shipments almost always had to be coupled with another mode, with attendant handling costs. These costs ranged from about \$1 to about \$4 a ton. He believed that, if barge rates increased 10 percent, his company might divert its shipments of finished

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<sup>1</sup>"An Interregional Analysis of U.S. Domestic Grain Transportation," Center for Agricultural and Rural Development, Iowa State University, Feb. 1975.

product from barge to rail. He further said that an increase in barge tariffs might encourage the railroads to lower their rates in order to better compete with barges.

Shipments of low-value bulk products, such as scrap iron, would likely continue to be shipped by barge when possible. An official of a company that fabricated steel products said that a 10-percent increase in barge rates would have no effect on incoming shipments of coal, coke, slag, fluorspar, and scrap iron but that such an increase might affect his company's pricing advantage in some markets which are supplied with finished products by barge.

WATERWAYS INDUSTRY'S CAPABILITY  
TO BEAR MAINTENANCE COST HAS IMPROVED

The services of the Corps in maintaining and operating waterways facilities are relatively fixed. The amount of dredging needed to maintain channel depths and the number of personnel needed to operate locks each year remain almost constant and would have little or no relationship to the amount of traffic using the waterways. During the early dredging years of the waterways, the O&M cost for each unit of traffic was high. Over the ensuing years, the rate of traffic growth accelerated at a much faster pace than the rate of increase in Corps services. By 1973 the O&M cost for each unit of traffic was much lower. If the main beneficiaries of the waterways facilities--recreational and commercial boaters--had paid for O&M costs, the burden, if in the form of a fuel tax, would have amounted to about 7 cents a gallon during 1973. For commercial users, the 7-cent fuel tax would have increased overall costs by about 4 percent.

In addition to increases resulting from normal inflation, O&M costs have increased over the years. Costs have risen due to such factors as more stringent dredging requirements and higher maintenance and repair needs for aging locks. On the more heavily traveled segments of the waterways, however, the number of locks and the operating hours and personnel needed for their operation have remained relatively constant over the years.

Of the \$227 million the Corps spent in 1973 for O&M, about \$109 million was spent on the inland waterways. (See app. V.) The costs averaged almost one-twentieth of a cent for each ton-mile of traffic.

Almost all the proposals to date for user charges have called for full or partial recovery of O&M costs. Some have, in addition, called for recovery of future construction costs.

Few have proposed that past construction costs be recovered. User charges can be levied by either a single tax or a combination of taxes and service charges. User charges which have been suggested include a fuel tax, an annual license fee, a segment toll, a lockage fee, and a congestion toll. President Ford has proposed legislation designed to recover annual O&M costs through a combination of segment tolls and lockage fees. Presidents Kennedy, Johnson, and Nixon proposed that recoveries be made through a fuel tax. H.R. 8590, introduced in July 1975, would levy segments tolls and lockage fees. In September 1975 the Committee on Ways and Means was considering this bill.

In 1973 inland waterways users, including recreational boaters, used an estimated 1.5 billion gallons of fuel. If user charges were enacted in the form of a fuel tax and if the tax were equivalent to the waterways' O&M costs (\$109 million), a tax of 7 cents a gallon would have been needed.

On the basis of financial reports available for 12 regulated waterways carriers, a 7-cent-a-gallon fuel tax in 1972 would have increased the carriers' total fuel cost from \$10.5 million to \$17.2 million. The \$6.7 million increase was about 5 percent of the carriers' total operating costs. In 1974, when average fuel costs rose from 11 cents to about 30 cents a gallon, the impact of a fuel tax would have had a somewhat less effect. In 1974 a 7-cent tax would have increased fuel costs from about \$28.7 million to \$35.4 million. The \$6.7 million increase would have represented about 3.6 percent of the carriers' total operating costs that year.

Not only does the 7-cent tax represent a small cost increase to the waterways carriers, it is moderate compared with the fuel taxes paid by the motor freight industry, which in 1973 averaged about 12 cents a gallon--a 4-cent-a-gallon Federal tax and an average 8-cent-a-gallon State tax.

#### Reaction of carriers and shippers to user charges

The user charges needed to recover 1973 waterways O&M costs are much more moderate than those predicted by an earlier analysis made by waterways carriers and shippers.

Organizations representing waterways shippers and carriers in the past generally have opposed efforts to establish user charges. Among the reasons frequently advanced by the groups was that the burden of recovering all waterways costs through user charges would be extremely severe, particularly if separate user charges were established to recover the O&M

costs for each waterways segment. Below is an analysis, made by one group of waterways users of predicted user charges, of 1968 data, for 14 waterways segments.

<u>Waterways segment</u>	<u>User charge</u> (cent per ton-mile)
Lower Mississippi	0.01
Ohio, Tombigbee, upper Mississippi, Tennessee, and Illinois	0.04 to 0.079
Monongahela, James, and Gulf Intracoastal	0.11 to 0.16
Arkansas, Allegheny, Willamette, Missouri, and Kentucky	0.9 to 3.5

Considering that the revenue per ton-mile for regulated waterways carriers averages about 0.4 cent, the waterways users' analysis shows that, for 5 of the 14 waterways segments, segment user charges, would result in a burden so severe that barge operations would either stop or be severely curtailed.

The waterways users have been opposed to even nominal user charges meant to partially recover waterways costs because they feared that, once such charges were established, approvals of increases would be relatively easy.

Although most waterways users were concerned about the potential extremities of user charges, not all were critical of the basic fairness of user charges. The president of one organization, which included both shippers and carriers, told us that the shippers and carriers would not oppose user charges, provided that users of the waterways for recreation, flood control, irrigation, and water supply would be required to share their costs.

Fuel used by commercial users of the waterways is not subject to Federal or State taxes; however, fuel used by recreational users is taxed by both the Federal and the State governments. The combined taxes paid by recreational users average about 12 cents a gallon. Many States permit these users to recover these taxes, but not all users apply for refunds. Federal laws permit users to recover 2 cents of the 4-cent Federal tax paid, but again, not all users apply for refunds. Although the Corps waterways maintenance program does not benefit from the taxes collected, recreational users, in effect, are paying waterways user charges.

DIVERSION OF TRAFFIC FROM WATERWAYS HAS  
SOME POTENTIAL FOR LIMITED ENERGY SAVINGS  
AND MORE EFFICIENT TRANSPORTATION

Diversion of waterways traffic to pipelines or railroads, resulting from the imposition of waterways user charges, has some potential for energy savings and more efficient transportation. However, this potential is limited and does not appear to be a major factor in establishing waterways user charges.

Our discussions with users of the inland waterways (see pp. 14 to 19) indicated that waterways user charges up to 10 percent of barge rates probably would result in some shifting of petroleum products and grain shipments to pipelines and railroads, respectively.

Any shifting of petroleum shipments to pipelines has the potential for reducing energy consumption. Recent studies by the National Science Foundation<sup>1</sup> and energy use data prepared by a major pipeline carrier generally show that fuel energy needed for a ton-mile transport of a refined product ranged from 250 to 428 Btu's for pipelines compared with 512 to 680 Btu's for waterways. A 1968 sample of towboat operators by the National Waterways Conference, Inc., showed that energy used by towboats averaged 415 Btu's. However, the energy savings indicated by these studies would depend on such factors as whether existing pipelines have the capacity to handle diverted waterways traffic or whether new pipelines need to be constructed. The energy spent in pipeline construction could mitigate any other energy savings or could result in a net increase, rather than a reduction, in energy consumption.

Similarly, studies by the railroad industry showed that shipments of grain and other commodities by unit trains rather than by truck-waterways had potential for some energy savings. One study<sup>2</sup> showed that a shipment by unit train of 100 cars moving from a single point of origin to a single destination would use 226 Btu's a ton-mile, which is about

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<sup>1</sup>"Energy Intensiveness of Passenger and Freight Transport Modes," Dr. Eric Hirst, April 1973. "The Effect of Fuel Price Increases on Energy Intensiveness of Freight Transport," Dr. W.E. Mooz, Aug. 1973.

<sup>2</sup>Research and planning staff, Illinois Central Gulf Railroad, April 1974.

twice as fuel efficient as a truck-barge shipment. Barge shipments use upward of 415 Btu's;<sup>1</sup> truck shipments average over 2,000 Btu's.<sup>2</sup>

Also unit-train shipments can be made faster than truck-barge shipments and, under some circumstances, might result in better productivity. For example, the transit time for grain from Dubuque, Iowa, to New Orleans, Louisiana, is about 3 days by unit train but about 10 days by barge. Additional time and productive effort is spent in transferring the grain from trucks to barges at the river terminal.

Many railroads parallel the major inland waterways, and railroad industry representatives told us that railroads had the capacity to handle some diverted waterways traffic or would purchase the necessary equipment if it could be used throughout the year.

Although shifting waterborne traffic to railroads would have some adverse economic impact on the waterways, trucking, and warehousing industries, there would be an offsetting increase in revenues to the railroads.

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<sup>1</sup>"Doing More With Less: Inland Waterways' Impact on U.S. Energy Supplies," Harry N. Cook and Robert D. Byrd, National Waterways Conference, May 1974.

<sup>2</sup>"Energy Intensiveness of Passenger and Freight Transport Modes," Dr. Eric Hirst, April 1973, and Railway Age, Dec. 10, 1973.

## CHAPTER 4

### AGENCY COMMENTS AND OUR EVALUATION

The Departments of Transportation, Commerce, and the Army and WRC reviewed a preliminary copy of this report, and we have considered their comments in this report. Their comments, which are highlighted below, are included as appendixes.

#### DEPARTMENT OF TRANSPORTATION

The Department of Transportation said (see app. I) that, considering the complexity of the subject, we did a fair job in touching upon the principal issues but that much of our comments on environmental and energy issues was speculative and one-sided, we had not discussed the environmental and safety impacts from potential waterways traffic diversions, and we had overlooked the importance of international markets served by the inland waterways.

We recognize that the information obtained from environmentalists may be speculative and one-sided, but it raises issues which will have to be considered in setting future policy for use of inland waterways. We also recognize that the information obtained during our study does not provide an adequate basis for making firm conclusions on these matters, however, we believe they are factors which need to be considered before a final decision is reached.

The Department also said our study should have included coastal harbors and the Great Lakes since the Federal Government's investment in waterways and navigation facilities in these areas is as important as its investment in the inland waterways. We selected the inland waterways for study because of the current interest and many conflicting views regarding their future role as a major transportation mode in the U.S. transportation system.

In addition, the Department pointed out that, to have a truer picture of inland waterways O&M costs, the costs of the Coast Guard and other Federal agencies should be included. The Coast Guard's costs on the inland waterways are not readily determinable; however, the United States Railway Association estimated them at about \$40 million for operation of navigation aids, search and rescue, and environmental protection. We believe that these costs, and the Tennessee Valley Authority's costs, should be considered in establishing user charges.

DEPARTMENT OF COMMERCE

The Department of Commerce said (see app. II) that it appeared that we had judged the inland waterways barge industry to be a monolithic industry when, in fact, it was diverse with respect to company size, service, geographical operations, and competitive posture relative to alternative transportation modes. The Department further said that any implication that user charges equivalent to 10 percent or less of barging rates would not be detrimental to the industry or to the Nation, without a comprehensive analysis of the long- and short-range economic impacts, seemed less than appropriate. The Department listed a number of possible adverse effects, such as the impact on balance of payments, regional dislocations, the impact on depressed areas, and port discrimination, which it believed should be considered in setting a user charge policy.

We believe the report adequately describes the diversity of towing operations, types of services provided, and the industry's competitive posture with other transportation modes. We are not suggesting that policy decisions be made without a detailed analysis of the economic impact on the waterways industry, or the Nation, of the imposition of waterways user charges. We believe that, to insure the most efficient use of the Nation's resources and to provide an even-handed Federal approach to transportation, such matters as further Federal expenditures on the inland waterways and waterways user charges need to be reconsidered.

The Department thought that the examples we obtained from individual waterways shippers and carriers of the effect of user charges were isolated examples and were not representative of the industry's viewpoint nationwide. Although we have not determined industry's viewpoint nationwide, we have talked to responsible officials of carriers and shippers of the principal commodities being moved in the waterways, and we feel that their views show the potential impact of modest user charges on the waterways industry.

The Department questioned the validity of the 1.5 billion gallons of fuel used in our calculation of a 7-cent-a-gallon fuel tax, contending that it improperly included diesel fuel the shipping industry used on the Great Lakes and coastal waters. We predicated our estimate of annual fuel consumption on gasoline used by recreational boaters, as well as diesel fuel used by commercial carriers and recreational boaters, on the inland waterways and did not include fuel used on the Great Lakes and coastal waters.

The Department questioned our use of the range of 250 to 428 Btu's of energy required to transport refined product a ton-mile by pipeline and cited a study which concluded that fuel efficiency for pipelines averaged 1,850 Btu's per ton-mile. We are aware of this 1971 report in which a determination for all pipelines was based on financial information supplied to ICC. In two more recent studies, energy requirements for transporting crude and refined petroleum products ranged from 220 to 450 Btu's per ton-mile. Because the range of energy requirements can vary according to pipeline diameter, fluid velocity, and fluid viscosity, we obtained data from a pipeline company engaged in transporting refined petroleum products. Its calculations indicated that, on the average, 250 Btu's are used for transporting products a ton-mile through lines of 16- to 28-inch diameters and 428 Btu's through lines of 6- to 14-inch diameters.

The Department also contended that our conclusion that diversion of waterways traffic had some potential for more efficient transportation was inconsistent with data showing that waterborne commerce handled 16 percent of the Nation's total freight for only 2 percent of the national freight cost and that the average freight rate for regulated inland waterways carriers was about 3.7 mills a ton-mile compared with about 13.5 mills a ton-mile for bulk shipments by rail. Our conclusion dealt with the potential for savings on energy and faster delivery of certain shipments and not with freight rates as the Department interpreted it.

#### DEPARTMENT OF THE ARMY

The Department of the Army noted (see app. III) that our report dealt primarily with the navigation aspects of the inland waterways and with user charges and suggested that we should have given more consideration to the total economic, social, and environmental impacts resulting from user charges and system expansion. We believe it was entirely proper for us to have emphasized the navigation features of the waterways, because construction of the system and plans for its expansion have been based primarily on its use as a transportation mode. Regarding the totality of the economic, social, and environmental impacts resulting from user charges, we recognize that the information obtained during our study does not provide an adequate basis for making firm conclusions on these matters, however, we believe they are factors which need to be considered before a final decision is reached. The Department said that the role of water transportation should be assessed within the context of a cohesive transportation system, taking into consideration total transportation needs to meet existing and future national objectives and priorities. We fully support this view and believe the factors we identified as

needing consideration in setting a future waterways policy are not inconsistent with such an approach.

The Department contended that our report concentrated on conditions existing on the upper Mississippi River and gave an erroneous impression that these conditions were typical of the entire waterways system. This report, in fact, includes data and other information on the Illinois and Ohio River segments as well as the upper Mississippi River segment. We selected these waterways segments for review because they included many of the major facilities, congestion on them seemed to be particularly acute, and the estimates of potential future Federal expenditures required for them were quite large. Although environmentalists we interviewed were concerned primarily with conditions on the upper Mississippi, Illinois, and Ohio Rivers, we believe these views are fairly representative of the concerns about Federal actions that impact on the Nation's rivers and other natural waterways.

The Department also expressed concern that our report did not mention the environmental impact or the inconvenience to the public which would occur if much of the bulk materials carried by barges were to be diverted to other transportation modes. Studies we obtained and discussions we had with waterways shippers and carriers indicated that user charges up to 10 percent of barging rates would result in only a small amount of traffic diversion from the inland waterways to pipelines, railroads, and the trucks. However, the ability of other modes to absorb any traffic diversions and the resulting environmental problems caused by such diversions should be considered in setting waterways use policy.

The Department said that the theory that railroads and pipelines could meet demands for transportation while using less energy than waterways could not be accepted as a general conclusion applicable to all situations and that we gave no specific information, data, or creditable evidence supporting this theory. The Department cited data showing that rail transport of 50,000 tons from St. Louis, Missouri, to New Orleans would require about 20 percent more horsepower-days than an equivalent movement by barge to support its contention that barges were more efficient than trains.

We did not say that diversion to rail and pipelines would always result in energy savings. Rather, we pointed out that there was some limited potential for energy savings in diverting oil products to pipelines and other bulk products to unit trains, but we cautioned that it might not be true in all cases.

The Department also said that no serious attempt had ever been made to fully address the total impact of user charges on the waterways industry and said, as did the Department of Commerce, that the information we presented in chapter 3 was insufficient and could lead to wrong conclusions. We believe the user-charge studies listed along with the views of waterways shippers and carriers are useful in showing the potential impact on the waterways industry of modest user charges.

UNITED STATES WATER RESOURCES COUNCIL

WRC said (see app. IV) that it was not in a position to comment on the policy implications of our report because WRC may make specific recommendations to the President with respect to cost-sharing policies when it completes its study of national planning objectives for water and related resources projects.

## CHAPTER 5

### SCOPE OF REVIEW

We reviewed legislation, various reports, studies, articles, and financial and operating records pertaining to the operation and maintenance of the waterways and to the waterways industry.

We made our review primarily at the North Central Division, Chicago District, St. Louis District, and St. Paul District of the Corps of Engineers and at waterways locations along the upper Mississippi River in Illinois, Minnesota, Missouri, and Wisconsin. We met with and obtained waterways studies and other data from the following Federal agencies and commissions.

- Office of Management and Budget
- Interstate Commerce Commission
- Commodity Credit Corporation
- Department of Commerce
- Department of the Treasury
- Federal Energy Administration
- Federal Railroad Administration
- Fish and Wildlife Service
- U.S. Coast Guard
- Upper Mississippi River Basin Commission
- Water Resource Council

We also met with waterways carriers; shippers; trade associations representing waterways operators, waterways shippers, railroads, pipelines, the coal industry, and the petroleum industry; State Commerce Commissions; transportation consultants; economists; and academicians.



OFFICE OF THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

ASSISTANT SECRETARY  
FOR ADMINISTRATION

JUL 25 1975

Mr. Henry Eschwege  
Director  
Resources and Economic Development  
Division  
U.S. General Accounting Office  
Washington, D.C. 20548

Dear Mr. Eschwege:

This is in response to your letter dated May 30, 1975, requesting the Department of Transportation's comments on the General Accounting Office's report entitled "Factors to be Considered in Setting Future Policy for Use of Inland Waterways". The report does a fair job in touching upon the principle issues; however, the report does not give adequate treatment to the economic effect of policy changes. I have enclosed two copies of the Department's position on the report.

Sincerely,

A handwritten signature in black ink that reads "William S. Heffelfinger". The signature is written in a cursive style with a long horizontal flourish at the end.

William S. Heffelfinger

Enclosure  
(two copies)

DEPARTMENT OF TRANSPORTATION REPLYTOGAO DRAFT REPORT OF MAY 30, 1975ONFACTORS TO BE CONSIDERED IN SETTING FUTURE POLICYFOR USE OF INLAND WATERWAYSSUMMARY OF GAO FINDINGS AND RECOMMENDATIONS

There are no recommendations contained in the draft report. The draft report presents information on matters which, in the opinion of the GAO, the Congress will need to consider in establishing a national policy for funding inland waterway improvements and operations and in considering the President's proposal for enactment of waterway user charges. Highlights of the information presented are as follows:

- The Federal Government has covered virtually the entire cost of developing and maintaining the inland waterways and has paid for it through taxes on the general public.
- The expansion of the waterway industry has reached a point where some main waterway arteries are becoming overcrowded.
- The Federal Government has always permitted free use of the waterways for industrial transportation and recreation.
- Environmental groups are generally opposed to increasing waterway traffic and are adamantly opposed to any projects which enlarge waterway facilities.
- Waterway traffic volume has reached a point where a relatively nominal user charge would allow for recovery of the annual operating costs.
- Operation and maintenance costs have increased due to inflation, more stringent dredging requirements and higher maintenance and repair needs for aging locks.
- If waterway carriers were assessed a user charge, all or a large part of the cost probably would be passed on to the shippers or receivers, causing some to seek alternative shipping modes.
- Diversion of waterway traffic to pipelines or railroads, caused by the imposition of waterway user charges, has some potential for energy savings and more efficient transportation but does not appear to be a major factor in establishing waterway user charges.

SUMMARY OF THE DEPARTMENT OF TRANSPORTATION POSITION

The draft report is rather brief considering the complexity of the subject; however, it does a fair job in touching upon most of the principal issues. The analysis is less fair in the treatment of safety, environmental and energy considerations of inland water transportation. We do not believe the report in its present form is thorough enough to offer help to the Congress in setting policy, and perhaps its submission should await the outcome of the Section 80 study of the Water Resources Council, now scheduled for completion by the end of this summer.

Much of the commentary on environmental and energy issues is speculative and one-sided. The report makes several references to potential limited energy savings from traffic diversion to other modes. The implication that barge transportation is not as energy efficient as rail transportation is not supported in the report. Potential environmental impacts resulting from any rail and pipeline modifications to handle increased capacity created by diverted water tonnage are not discussed in the report. Also, there is no discussion of the safety implications of diverting cargo; particularly with respect to hazardous materials.

The report overlooks any consideration of the importance of international markets served via inland waterways as a factor to be considered in setting future policy for use of inland waterways. It is difficult to define inland waterways for purposes of cost recovery and assessing the impact of user charges. We feel the GAO report should have included coastal harbors and the Great Lakes since the Federal Government's investment for waterway and navigation facilities in these areas is as significant as it is for inland waterways. The title of the draft report suggests that the report concerns future policy for the use of inland waterways. In reality, the report deals with the future funding of inland waterways. It is suggested that the title of the draft report be changed to: "Factors to be Considered in Setting Future Funding Policy for Use of Inland Waterways."

POSITION STATEMENT

As mentioned before, the draft report does a fair job in touching upon the principal issues; however, the report does not give adequate treatment to the economic effect of such policy changes and there are several discussions of factual material within the report that are in error or are incomplete or need further elaboration and are discussed herein.

On page 3 in the first paragraph, where 1,800 waterway carriers are mentioned, it should be noted that these include lake and coastal carriers. Many others are one-ship companies that are leased to the operating carriers. We think that for clarity this part of the paragraph should be changed to read: "In 1972, about 8 percent of domestic waterway shipments measured in ton-miles were regulated by the ICC. About

200 carriers have ICC rights, but only 20 to 30 use them to transport regulated commodities. Another 150 carriers who operate exempt from economic regulation on the inland waterways are engaged in private carriage or handle only bulk shipments. The ICC has no regulatory authority for these movements and a free market operates to determine charges for the exempt for-hire services."

On page 4 in the last line of the second paragraph, insert "partial" before "recovering" since the \$100 million recovery envisioned in the 1974 bill would not recover all of current O & M costs.

On pages 5/6, mention is made of the Section 80 study under the Water Resources Development Act of 1974. The results of this study should be incorporated into the GAO report before it is released.

[See GAO note, p. 35.]

Also on page 9 with respect to the last paragraph dealing with the Corps management of overcrowded locking conditions, it should be mentioned that the Corps is carrying out a two-year study of Inland Navigation System Analysis (INSA) which is attempting to provide non-capital solutions to the congestion problem.

[See GAO note, p. 35.]

On page 12 in the discussion of costs to improve the waterways, we believe it would be beneficial for the Congress to have a more detailed breakdown of how the \$6.7 billion is to be spent in terms of work to be accomplished, new construction, maintenance, location, etc.

[See GAO note, p. 35.]

We recognize that the water mode has more obvious environmental impact particularly due to dredging and major construction work. However, we feel the section dealing with the environment from page 12 through 18 should contain comments dealing with the environmental impact of traffic diversions to rail, pipelines and highways. This would point out what environmental costs would accrue to the use of other modes handling the diverted cargo.

[See GAO note, p. 35.]

Also on page 20 with respect to a Federal Interdepartmental Task Force Report on cost sharing for water resources investment, it should be noted that this study was done rather quickly and has no statistical basis for its estimates of diversion impact. It is our position that impact assessments to date are assumptions at best, and that any user charge policy would probably be best imposed at minimal levels to enable a realistic appraisal of impact.

[See GAO note, p. 35.]

In order to have a truer picture of OM & R costs, the table on page 35 should be expanded to include Coast Guard costs as well as any other Federal agencies incurring such kinds of costs. Also, in this connection, as we indicated earlier the waterways should not be limited to the segments shown but should also include coastal and Great Lakes OM & R costs.



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Robert Henri Binder  
Assistant Secretary  
for Policy, Plans and International Affairs

DATE: JUL 25 1975

GAO note: Deleted comments refer to material in draft report which has been revised in or deleted from this final report.



**UNITED STATES DEPARTMENT OF COMMERCE**  
**The Assistant Secretary for Administration**  
Washington, D.C. 20230

August 5, 1975

Mr. Henry S. Eschwege  
Director, Resources and Economic  
Development Division  
U.S. General Accounting Office  
Washington, D. C. 20548

Dear Mr. Eschwege:

This is in reply to your draft report entitled "Factors to be Considered in Setting Future Policy for Use of Inland Waterways."

We have reviewed the enclosed comments of the Assistant Secretary for Maritime Affairs and believe they are responsive to the matters discussed in the report.

Sincerely yours,

Guy W. Chamberlin, Jr.  
Acting Assistant Secretary  
for Administration

Enclosure





**UNITED STATES DEPARTMENT OF COMMERCE**  
**The Assistant Secretary for Maritime Affairs**  
Washington, D.C. 20230

JUL 31 1975

MEMORANDUM FOR: Director, Office of Audits  
Department of Commerce

Subject: GAO Draft Report on "Factors to be Considered in Setting  
Future Policy for Use of Inland Waterways"

In accordance with the provisions of Department Administrative Order 213-1, enclosed are the comments of the Maritime Administration on the draft report of the Comptroller General on the above subject.

*Rw* *Howard J. Blackwell*  
ROBERT J. BLACKWELL  
Assistant Secretary  
for Maritime Affairs

Enclosure



**UNITED STATES DEPARTMENT OF COMMERCE**  
**The Assistant Secretary for Maritime Affairs**  
Washington, D.C. 20230

JUL 31 1975

Mr. Henry S. Eschwege  
Director, Resources and Economic  
Development Division  
U.S. General Accounting Office  
Washington, D.C. 20548

Dear Mr. Eschwege:

On June 27, 1975, the Maritime Administration received copies of the General Accounting Office draft report "Factors to be Considered in Setting Future Policy for Use of Inland Waterways" for review and comment. I am pleased to submit the following comments.

The draft report suggests that a user charge equivalent to ten percent or less of barging rates would not be detrimental to the industry. It appears that the inland waterway towing industry is being judged in terms of a monolithic industry when, in fact, it is very diverse with respect to company size, transportation service, geographical operations and, most importantly, competitive posture relative to alternative modes of transportation. To imply that a user charge equivalent to ten percent or less of barging rates would not be detrimental to the towing industry or to the nation, without a comprehensive analysis of the long and short range economic impact of such charges, would seem less than appropriate.

Our review also indicates that further development in two other areas appears to merit consideration. First, there are statements throughout the report which are either incorrect or so written as to lead the reader toward false conclusions based on incomplete information. Second, the report falls short of addressing all of the major factors which should be considered in setting future policy for the use of inland waterways. We offer the following more specific comments in support of our views in each of these two areas.



[See GAO note, p. 43.]

In all of the projections available to the Maritime Administration, there will be a steady and substantial increase in the demand for transportation by all modes through the year 2000. Just as important as this increase in transportation demand is the fact that the market share for inland waterway transportation is projected to remain essentially constant or to even decrease slightly during this period of time. It is important to note that these market share projections are predicated on "normal" system expansion without any extraordinary outside forces acting on the system. Two such outside forces which would exert restrictive pressure on inland waterway transportation are effective reduction in navigation improvements and increased water transportation system costs not matched by commensurate cost increases for other modes of transportation. Effective Federal budget reductions for commercial navigation improvements are already being experienced. A navigation user charge is now under consideration in the draft report. With the combination of these two restrictive forces, inland waterway transportation could lose a substantial share of its transportation market. We do not believe that this would be desirable in a viable national transportation system.

The ultimate paragraph on page iv of the DIGEST lists some favorable effects which could be expected if water carriers were assessed a navigation user charge. While each item on the list appears to require additional support for justification, our major concern is the fact that the draft report is silent on possible detrimental effects of a user charge. The report does not sufficiently address:

- . A balanced national transportation system;
- . Competitive position of U.S. commodities in foreign markets and of foreign products in U.S. markets;
- . Balance of payments;

- . Regional dislocations;
- . Impact on depressed areas;
- . Potential port discrimination;
- . Shallow versus deep draft vessel discrimination on the same waterway;
- . Additional national transportation cost;
- . Diversion of cargo to less safe modes of transportation;
- . Ripple effect of a user charge at the front end of the production cycle; and
- . Impact on existing industrial investment along the waterways.

We believe that a report considering navigation user charges should present both the favorable and adverse potentialities associated with such charges.

[See GAO note, p. 43.]

The theme of CHAPTER 2 is that inland waterway conditions today are vastly different than in prior years and that there is a need to consider altering such prior policies. There is little attempt to assess changing or future transportation requirements of the Nation. The major conclusions of CHAPTER 2 are that inland waterway capacity at key locations is becoming inadequate to handle traffic and that increasing commercial use of waterways has a detrimental impact on the environment. Restricting the expansion of waterway traffic is implied as the solution to these problems. We believe that other alternatives should also be recognized in the draft report. The "Principles and Standards for Planning Water and Related Land Resources," developed by the Water Resources Council, requires that:

"Plans for the use of the Nation's water and land resources will be directed to improvement in the quality of life through contributions to the objectives of national economic development and environmental quality. The beneficial and adverse effects on each of these objectives will be displayed in separate accounts with other accounts for the beneficial and adverse effects on regional development and social well-being ...."

An example of the implementation of this policy is a plan for the Upper Mississippi River being developed by a government-industry task force which will include all aspects of river benefits such as fish and wildlife habitats, commercial navigation, flood control, recreation and water shed capability.

With respect to inland waterway capacity, the Corps of Engineers has an extensive program underway to enhance utilization of the existing waterway system and to better identify where structural improvements are necessary. It is noted that each improvement project must pass the test of cost effectiveness before it is undertaken. It seems to us that a proposed project which passes the test of cost effectiveness and which has a comprehensive environmental impact statement is a proper solution for a capacity constraint in lieu of restricting the expansion of waterway traffic.

CHAPTER 3 reviews major commodity movements on the inland waterways. In most of the discussion there are statements attributed to individual shippers or consumers related to particular commodity movements which suggest that there would not be an adverse economic impact if navigation user charges were established. We are concerned that these isolated statements have been expanded to imply a viewpoint throughout the inland waterways industry on a national basis. This simply cannot be done. Every meeting, discussion, or conference that Maritime Administration officials have attended or participated in has revealed a very deep concern by industry leaders about the adverse effects of navigation user charges. It is noted that the draft report does not reflect the viewpoints of national organizations such as The American Waterways Operators, Inc., the Water Transport Association, the National Waterways Conference, or the Water Resources Congress.

An example of incorrect analysis may be found on page 28. The report states that if a user charge were enacted in the form of a fuel tax and the tax were equivalent to the inland waterway's operation and maintenance costs (\$109 million), a tax of 7 cents a gallon would have been needed. This is premised on fuel usage of 1.5 billion gallons. However, it is our understanding that the 1.5 billion gallons of fuel consumed applies to all diesel fuel consumed on the inland waterways, Great Lakes, and coastal waters. Thus, the required fuel tax for inland waterways only would have to be substantially higher than 7 cents a gallon and a reanalysis of impacts should be undertaken.

Another example of analysis open to challenge may be found beginning on page 31 of the draft report under the subsection "Diversification of Traffic from Waterways Has Some Potential for Limited Energy Savings and More Efficient Transportation." It is noted

that page 19 of the report states that "this potential is rather limited and does not appear to be a major factor in establishing a user charge." And yet, this potential is conceptually emphasized to the reader on both pages i and iv of the DIGEST. We believe that inclusion of this potential in the DIGEST misleads the reader. More importantly, we believe that the report has not considered other factors which could lead the reader to conclude that diversion of traffic from waterways would have just the opposite effect on energy savings and transportation efficiency. For example, a statement on page 31 indicates that the energy needed for ton-mile transport of refined product, on the average, ranges from 250-428 BTU for pipelines as compared to 512-680 BTU for waterways. We are aware of at least six available studies where fuel efficiency for water transportation ranges from 415-680 BTU per ton-mile. One of these studies concludes that fuel efficiency for pipelines averages 1850 BTU per ton-mile. The difficulty in determining fuel efficiency for pipelines lies in the proper selection of average velocity, viscosity and pipe diameter. Authorities have had differing opinions about this selection and hence different conclusions on pipeline fuel efficiency have resulted. Regardless, the draft report should present a balanced approach to energy efficiency and not be selective in reference sources to support an allegation.

With respect to transportation efficiency, reference to page 8 of the draft report yields a statement that waterborne commerce handles 16 percent of total freight while accounting for only 2 percent of national freight cost. Analysis of 1973 Interstate Commerce Commission data indicates that the average freight rate for regulated inland waterway carriers was approximately 3.7 mils per ton-mile and that the average freight rate for bulk transportation by rail was approximately 13.5 mils per ton-mile. A conclusion that diversion of traffic from waterways has some potential for more efficient transportation is entirely inconsistent with the preceding data.

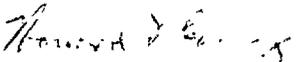
[See GAO note, p. 43.]

[See GAO note, p. 43.]

In summary, Maritime Administration review of the draft report suggests that several specific portions be reexamined for accuracy and balanced approach. We also recommend that additional effort be initiated to evaluate the potential adverse impacts of implementing navigation user charges.

Thank you for this opportunity to review and comment on the draft report.

Sincerely,

  
ROBERT J. BLACKWELL  
Assistant Secretary  
for Maritime Affairs

GAO note: Deleted comments refer to material in draft report which has been revised in or deleted from this final report.



DEPARTMENT OF THE ARMY  
OFFICE OF THE ASSISTANT SECRETARY  
WASHINGTON, D.C. 20310

22 AUG 1975

Mr. Henry Eschwege  
Director, Resources and  
Economic Development Division  
U. S. General Accounting Office  
Washington, D. C. 20548

Dear Mr. Eschwege:

On behalf of the Secretary of Defense, this is in response to your recent letter requesting comments on GAO Draft Report "Factors to be Considered in Setting Future Policy for Use of Inland Waterways." (OSD Case #4093)

Although the report is being prepared for use by Congress in developing policy for the use of inland waterways, we note the contents are primarily limited to navigation and waterway user charges. We suggest that the report be expanded to give consideration to the total economic, social and environmental impacts which would result from user charges on the waterways and expansion of the system. Additionally, there is a need to assess the role of water transportation within the context of a cohesive transportation system taking into consideration total transportation needs to meet existing and future national objectives and priorities.

The Upper Mississippi River navigation system, which is only a small segment of the 25,000 mile waterway navigation system, was used as the basis for this report. Although this segment is not typical of the total waterway system, it was reflected in the report as a condition of the waterways in general.

[See GAO note, p. 52.]

It is stated in the report that the capacity at several locks has been reached, or nearly reached, and that the provision of additional facilities would attract more carrier expansion. It is further stated that expanded use of the rivers for commercial traffic is not only



Mr. Henry Eschwege

extremely costly, but may be delayed or cancelled due to serious objections by environmentalist groups. However, no mention is made of environmental problems that would surely result from building additional railroads, pipelines or highways and of the adverse impact of increased highway and railway traffic on air and noise pollution levels in cities and suburban areas. Again, total transportation needs and means of meeting these needs must be examined together before reaching conclusion by looking at one system in isolation.

The report states that there is some potential for less energy consumption in moving commodities by railroads, pipelines and a combination of railroad and highways, than by waterways. The statements on this view are general and without qualification as to location, facilities available for each mode or commodities involved. Under some circumstances railroad and pipeline transportation are more energy efficient than waterways, but in some situations the reverse is true. No general conclusion should be made covering all locations, available facilities and commodities to be moved.

The discussion with respect to the impact of user charges is confusing and appears to be contradictory within the report. The report states that an increase of 5 to 10 percent in shipping rates due to user charges would have an insignificant impact on diversion of traffic away from the waterways. However, the report then states the benefits which may occur because of diversion of traffic due to user charges. The discussion of traffic diversion from waterways to other modes would be improved if tied explicitly to the magnitude of the user charge, its impact on existing traffic, and its impact on potential future traffic. The report should also be explicit with respect to the existing waterway system versus a modified and improved system with increased capacity. Consideration should also be given to trends in rates of increases of costs in shipping by various modes. Future rates for shipment by rail and highway will probably have a greater impact on diversion of traffic either to or away from the waterways than user charges.

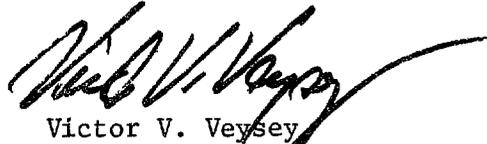
The coverage on environmental effects of the existing waterway system and of potential increased traffic volumes neglect to state beneficial environmental effects. For example, the existing navigation pools created by navigation dams on the Upper Mississippi River have greatly enhanced the natural capacity and desirability of the Mississippi Valley flyway for waterfowl. Also the detrimental effects alternative modes of transportation would cause are not mentioned or compared to those anticipated from use of the waterways.

Mr. Henry Eschwege

Although I appreciate GAO's need to protect the confidentiality of its sources, I could not ascertain whether the unattributed statements ascribed to either waterway industry spokesmen or environmental interests, are at all representative of prevalent viewpoints.

More detailed comments, specifically related to the pertinent parts of the draft report, are furnished in the inclosure.

Sincerely,



Victor V. Veysey  
Assistant Secretary of the Army  
(Civil Works)

1 Incl  
as

Comments on Review of Draft of Report to Congress of the United States  
"Factors to be Considered in Setting Future Policy for Use of Inland Waterways"

[See GAO note, p. 52.]

2. Page iii, fourth paragraph in DIGEST. Clarification and expansion of the discussion on the results of user charges is recommended, as noted in the basic letter.

3. Page iv, paragraph 2 in DIGEST. This paragraph states that if user charges are placed on water carriers, the added cost would be passed on to the shipper and that some traffic would be diverted to other transportation modes. It is further stated that while the waterway carrier industry would lose business benefits would accrue because of (a) less traffic congestion; (b) less detrimental effects to environment and (c) potential energy savings from more efficient transportation such as railroads and pipelines. All three of these claimed benefits are predicated on: (1) traffic congestion on a waterway being more of a detriment to the public than congestion on railroads and highways; (2) that greater environmental damage will result from increases in waterway traffic and improvement in waterways than from building additional rail, highway and pipeline facilities and diverting waterway oriented traffic to these modes; and (3) a generalized unproven theory that railroads and pipelines can meet demands for transportation with less expenditure of energy than waterways.

No explanation is offered as to how traffic congestion on waterways would inconvenience the public more than traffic congestion on railroads and highways. Waterways serve primarily the needs to move enormous quantities of raw bulk commodities where transit times are not normally of paramount concern. On the other hand railroads and highways carry all kinds of manufactured items, perishable goods, and food products and machinery, all of which demand more rapid movement. If very much of the bulk raw materials that are normally carried by waterways were to be diverted to the railroads and highways, movement of all kinds of products would be affected and more public inconvenience would result from the increased traffic congestion on the railroads and highways.

The reasoning behind the claims that increased environmental damage will always occur if waterway traffic increases is also vague and is not supported by facts. Later in the report, it is stated that increased waterway traffic causes accelerated bank erosion; that agitation from towboat propellers causes greater turbidity which adversely affects marine plants and fish habitat; and increases the hazard of catastrophic pollution from an accident to barges carrying various chemical cargoes. Accelerated bank erosion can occur in some locations, however, this can be stopped by proper bank protection methods. It is also worth noting that many other sources of erosion contribute to suspended sediment load of streams and that the character of the watershed, activities on the watershed (farming for instance) and hydrologic conditions all have a much greater effect on the sediment load of streams than movement of towboats. In addition under some conditions high speed movement of a recreational boat can produce as much bank erosion as a 20,000 ton tow.

The possibility of accidental rupture or sinking of a barge carrying poisonous or lethal chemicals can be reduced to an absolute minimum by monitoring and surveillance of movement of such products by the Coast Guard from point of origin to destination.

Building an entirely new waterway in some instances produces some environmental damage. In other instances construction of navigable waterways with multipurpose reservoirs including, flood control, power and water conservation features have provided benefits of great magnitude to fish and wildlife, to scenic enjoyment and to waterfowl. The Arkansas River Waterway is an example of a development that has certainly enhanced the environment while at the same time making possible economic growth that improves living conditions and general welfare for many people. It is interesting to note that in recent years, environmentalists have opposed any improvements on the Upper Mississippi River on the grounds that they want to leave the River in its present "natural state" and list such factors as possible loss of wetlands, loss of wildlife habitat and damage to fish as their principal reasons. The fact that the River is not presently in a natural state and has not been since the late 1930's seems to have been overlooked. In fact it was construction of the navigation dams that created the pools and wetlands which provide habitat for fish, waterfowl and wildlife.

The view that diverting commodity movement and traffic to railroads, highways and pipelines will cause less adverse effects to the environment is not supported by facts and is subject to question. As will be shown later, one 6,000 horsepower towboat with a 40 barge tow can move in one trip as much pay load as 5 one hundred car trains with each car carrying 100 tons. Such a train would require a minimum of 4 three-thousand horsepower Diesel locomotives. Movement of a 4 unit Diesel engine train with an aggregate tonnage of 13,000 tons through cities and suburban areas unquestionably produces more noise and air pollution than movement of a 6,000 horsepower towboat on a waterway. Similarly movement of a fleet of 60-ton trucks on a highway would create even more obnoxious and adverse impacts on the environment.

The theory that railroads and pipelines can meet demands for transportation with less expenditure of energy than waterways cannot be accepted as a general conclusion applicable to all situations. No specific information, data or creditable evidence is presented in support of this theory, although, later in the report, studies are mentioned which are purported to show that waterway transport consumes more energy. There may be instances where rail facilities which roughly parallel a waterway can move some freight more efficiently, but no generalization can be made on this question. Consider for example, movement of a commodity such as coal or wheat or petroleum between New Orleans, Louisiana and St. Louis, Mo. The travel time for a 6,000 horsepower towboat with a 40 barge tow carrying 50,000 to 55,000 tons averages (upstream and downstream) 7 days. This trip would consume the fuel required to keep the 6,000 horsepower Diesel engines of the towboat running continuously for 7 days. Expressed in units of horsepower-days, the fuel required would be the amount needed to produce 6,000 x 7 or 42,000 horsepower-days of work.

To move this same tonnage on a railroad would require five 100 car trains with each car carrying a pay load of 100 tons. For each of the five 10,000 ton trains, a minimum of 4 three thousand horsepower Diesel-electric locomotives would be required, depending on the ruling grade of the road bed. Thus the five trains would require an aggregate of 20 three thousand horsepower locomotives or a total of about 60,000 horsepower. However, the actual running time by rail from St. Louis to New Orleans for freight movement is not less than 20 hours or 0.833 of a day, and this value may be optimistic. Therefore, the rail movement would require fuel to produce 60,000 x 0.833 or 50,000 horsepower-days of work. Since the estimated work for the towboat was only 42,000 horsepower days, movement by railroad would require approximately 20 percent more fuel than movement by water. It must be emphasized that the above example presents only very approximate data. For an accurate comparison, more detailed information would have to be obtained on rates of fuel consumption of both railroad locomotives and towboats, railroad trip times and tonnage carried by the freight trains. However in the above example, in spite of very optimistic assumptions for the railroad, the waterway movement is more efficient by about 20 percent. It is believed that a more detailed and refined comparison would increase the 20 percent advantage of the waterway.

4. Page 7. Second paragraph states "Expansion of waterways to adequately accommodate added growth is not only extremely costly but may be delayed or canceled due to objections raised by environmental interests." "Extremely costly" should be stated in terms of comparison to alternatives, which may be more costly. Although environmental interests may raise objections, and their objections should be given consideration, they should not dictate transportation policy.

5. Pages 8, 9, 10 and 11. CAPACITY AT KEY LOCATIONS BECOMING INADEQUATE TO HANDLE TRAFFIC. In paragraph 2 of page 9, the statement is made that lock facilities at several locations are becoming inadequate to handle traffic because of traffic growth; that delays are costly to the carriers; and that capacity has been reached at several locks on the Upper Mississippi and Illinois Rivers. These statements are only partially true. It is obvious that waterway users can still use these waterways and in spite of the delays at locks, users can still move commodities on the waterways at a lower cost than via competing modes. Otherwise, tonnages would not continue to increase.

[See GAO note, p. 52.]

[See GAO note, p. 52.]

Nevertheless, capacity at Mississippi River Locks 26 is the most critical, followed by Locks 24 and 25 and present the most serious problems.

6. Pages 12, 15, 16, 17. INCREASING COMMERCIAL USE OF WATERWAYS, DETRIMENTAL IMPACT ON ENVIRONMENT. Through use of general statements attributed to various environmental organizations a thesis is developed that (a) increases in waterway traffic without provision of additional facilities will have an increasingly adverse effect on the environment and (b), provision of additional navigation facilities to meet traffic demand will accelerate and accentuate further environmental damage. The organizations which purportedly furnished the general statements on environmental damage are:

Environmental Protection Agency  
Fish and Wildlife Service of Dept of Interior  
Sierra Club  
Izaak Walton League  
Unnamed "Environmentalists"

No factual data, studies or reports are mentioned here to support the claims made by the organizations listed above.

7. Pages 17 and 18. The subject report appears to accept a false premise, namely, that construction of additional locks will necessitate deeper channels. This is untrue as provision of deeper channels in the Upper Mississippi River is only one possible future alternative for increasing capacity of the waterway and as of the present does not appear to be feasible from an engineering standpoint or economically justified. Thus, the premise that construction of additional locks, which will not involve changes in pool levels over any significant portion of the River, will cause great environmental damage has no factual basis.

[See GAO note, p. 52.]

Second paragraph states that environmental groups are generally opposed to increasing waterway traffic and added waterway capacity. Throughout the report the environmentalist views are highlighted.

The environmental groups should be identified together with those governmental groups that are said to have their support.

9. Page 19. Chapter 3 attempts to discuss the impact of a user charge on waterway users. No serious attempt has ever been made to fully address the total impact of a user charge on the waterways. The information contained herein is insufficient and could lead to wrong conclusions for policy determination.

GAO note: Deleted comments refer to material in draft report which has been revised in or deleted from this final report.



## UNITED STATES WATER RESOURCES COUNCIL

SUITE 800 • 2120 L STREET, N.W. WASHINGTON, D.C. 20037

JUN 24 1975

Mr. Henry Eschwege  
 Director, Resources and Economic  
 Development Division  
 General Accounting Office  
 Washington, D. C. 20548

Dear Mr. Eschwege:

Thank you for providing the draft of a proposed report to the Congress "Factors to be Considered in Setting Future Policy for Use of Inland Waterways."

On September 23, 1974, the President assigned to the Water Resources Council responsibility to undertake the study called for in Section 80(c) of the Water Resources Development Act of 1974 (P. L. 93-251). The study is to include consideration of national planning objectives for planning water and related resources projects, the interest rate formula to be used in evaluating and discounting future benefits for such projects, and appropriate Federal and non-Federal cost sharing for such projects. The professional staff report is anticipated to be completed this summer, and the Council of Members will consider the options being developed later this summer, as noted in your draft report.

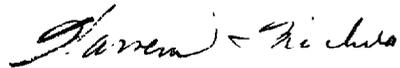
Inasmuch as the Council may make specific recommendations to the President with respect to cost sharing policies for the Nation's inland waterways system at that time, the Council is not in a position to respond to the policy implications of the draft report now. We have not made a detailed review of the factual and technical information developed in the report but would expect that the Departments of Transportation and the Army in their comments to you will address these matters.

MEMBERS SECRETARIES OF INTERIOR, AGRICULTURE, ARMY; HEALTH, EDUCATION AND WELFARE, TRANSPORTATION, CHAIRMAN, FEDERAL POWER COMMISSION - ASSOCIATE MEMBERS, SECRETARIES OF COMMERCE; HOUSING AND URBAN DEVELOPMENT, ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY - OBSERVERS DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET; ATTORNEY GENERAL; CHAIRMEN - COUNCIL ON ENVIRONMENTAL QUALITY, RIVER BASIN COMMISSIONS



We appreciate very much the opportunity to review the draft report, and subsequent to consideration of the Section 80(c) study would be interested in having an opportunity to comment on the substantive policy implications of the report if appropriate at that time.

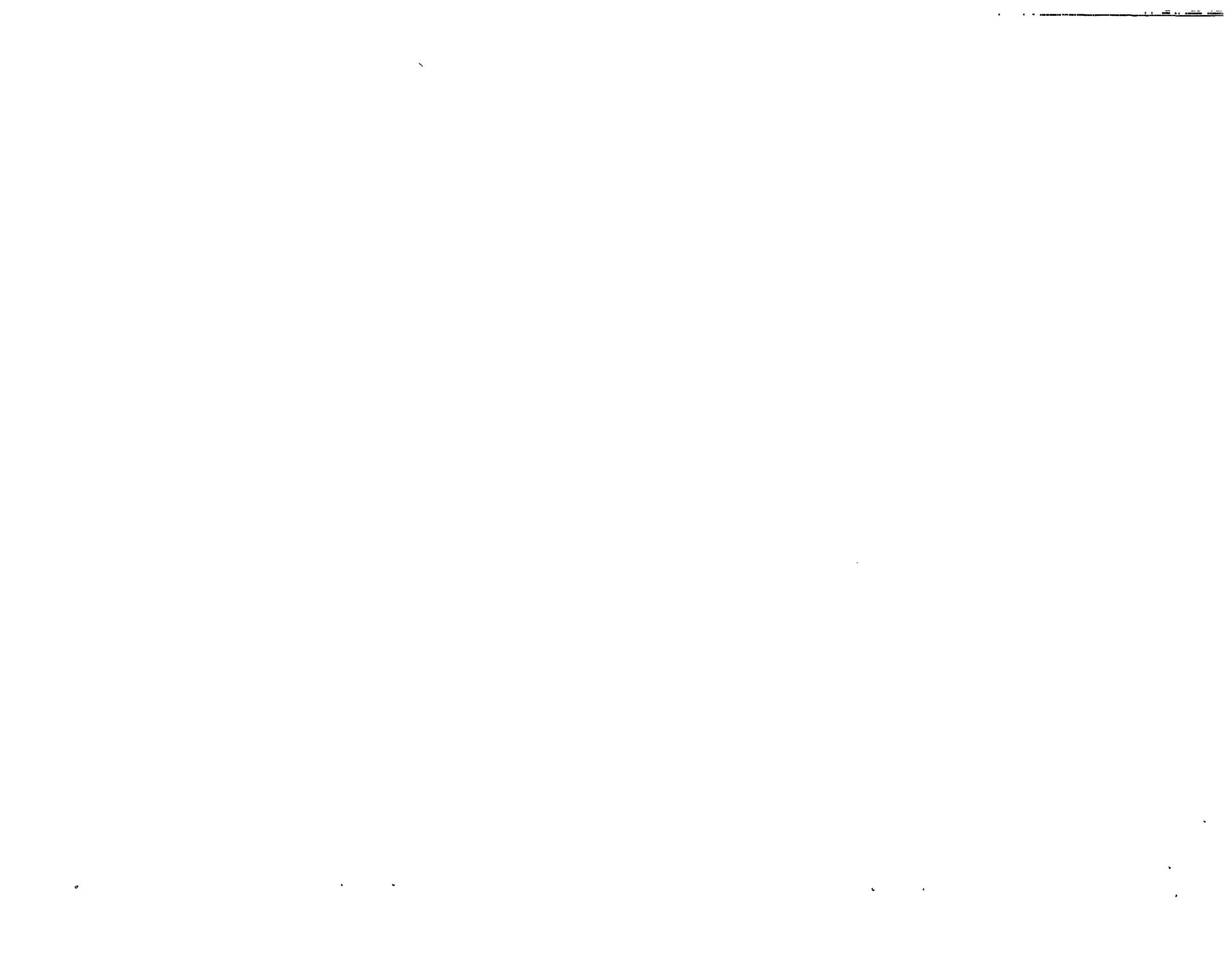
Sincerely,

A handwritten signature in cursive script, appearing to read "Warren D. Fairchild".

Warren D. Fairchild  
Director

CORPS OF ENGINEERS 1973 OPERATION  
AND MAINTENANCE EXPENDITURES ON INLAND WATERWAYS

<u>Waterways segment</u>	<u>1973 O&amp;M costs</u>	<u>Commercially navigable mileage</u>	<u>Number of locks</u>	<u>1973 ton-miles (000,000 omitted)</u>
Ohio	\$ 14,290,686	981	29	29,942
Missouri	12,134,000	735	-	884
Upper Mississippi	11,423,060	663	28	10,879
Arkansas	9,614,622	448	18	339
Illinois	6,978,029	354	8	8,451
Gulf Intracoastal	6,344,105	1,173	10	17,449
Chattahoochee	3,872,305	297	3	124
Atlantic Intracoastal	3,724,000	1,088	3	626
Lower Mississippi	3,590,578	1,174	1	96,079
Warrior-Tombigbee	2,918,989	463	7	3,729
Tennessee	2,503,293	650	9	3,928
Monongahela	2,314,246	129	9	1,495
Kanawha	1,645,583	91	3	796
Kentucky	1,160,749	259	14	52
Green-Barren	1,148,563	180	4	1,396
Allegheny	1,001,519	72	8	1
Others	<u>12,768,263</u>	6,919	73	56,138
	97,432,590			
Multipurpose project costs allocated to waterways navigation	<u>11,226,280</u>			
Total	<u>\$108,658,870</u>	<u>15,676</u>	<u>227</u>	<u>232,308</u>





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