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Before the Committee on Appropriations

Public Works for Water and Power Development and Atomic Energy Commission Appropriations

Fiscal Year 1974

H.R. 8947

93d CONGRESS, FIRST SESSION

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Part 7 (Pages 7503–7909)

RECALL HEARINGS:

ATOMIC ENERGY COMMISSION
DEPARTMENT OF THE ARMY
Corps of Engineers
DEPARTMENT OF THE INTERIOR
Bureau of Reclamation
TENNESSEE VALLEY AUTHORITY

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PUBLIC WORKS FOR WATER AND POWER DEVELOPMENT AND ATOMIC ENERGY COMMISSION APPROPRIATIONS FOR FISCAL YEAR 1974

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS UNITED STATES SENATE

NINETY-THIRD CONGRESS

FIRST SESSION

ON

H.R. 8947

AN ACT MAKING APPROPRIATIONS FOR PUBLIC WORKS FOR WATER AND POWER DEVELOPMENT, INCLUDING THE CORPS OF ENGINEERS—CIVIL, THE BUREAU OF RECLAMATION, THE BONNEVILLE POWER ADMINISTRATION, AND OTHER POWER AGENCIES OF THE DEPARTMENT OF THE INTERIOR, THE APPALACHIAN REGIONAL DEVELOPMENT PROGRAMS, THE FEDERAL POWER COMMISSION, THE TENNESSEE VALLEY AUTHORITY, THE ATOMIC ENERGY COMMISSION, AND RELATED INDEPENDENT AGENCIES AND COMMISSIONS FOR THE FISCAL YEAR ENDING JUNE 30, 1974, AND FOR OTHER PURPOSES

Printed for the use of the Committee on Appropriations

PART 7 (Pages 7503–7909)

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Corps of Engineers

DEPARTMENT OF INTERIOR
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TENNESSEE VALLEY AUTHORITY

U.S. GOVERNMENT PRINTING OFFICE

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PUBLIC WORKS APPROPRIATIONS FOR FISCAL YEAR 1974

MONDAY, JUNE 25, 1973

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 2 p.m., in room S–126, the Capitol, Hon. Alan Bible presiding.

Present: Senator Bible.

DEPARTMENT OF THE ARMY

CORPS OF ENGINEERS

LOWER MISSISSIPPI VALLEY DIVISION

STATEMENT OF MAJ. GEN. CHARLES C. NOBLE, PRESIDENT, MISSISSIPPI RIVER COMMISSION AND DIVISION ENGINEER, LOWER MISSISSIPPI VALLEY DIVISION

MISSISSIPPI RIVER SYSTEM REVIEW

Senator BIBLE. The subcommittee will come to order.

This afternoon we have with us Maj. Gen. Charles C. Noble, president of the Mississippi River Commission and division engineer of the Lower Mississippi Valley Division, who will give the subcommittee an overall review and report on the Mississippi River system in light of the disastrous and great flood of this spring.

Senator Stennis discussed with me by telephone the Mississippi flooding situation and, inasmuch as our original fiscal year 1974 hearing was held on March 12, prior to the floods, the subcommittee wanted to have you back, General Noble, so we could review what has occurred and what your requirements are for the upcoming fiscal year.

INTRODUCTION OF ASSOCIATES

Please introduce those accompanying you.

General NOBLE. Yes, sir.

I have with me, Mr. Chairman, the following members of the staff of the Mississippi River Commission: Homer B. Willis, chief of the Engineering Division; J. I. Boswell, chief of the Construction-Operations Division; Ernest P. Blankenship, executive assistant, Lower Mississippi Valley Division; Eugene H. Nettles, chief, Program Development Office, Lower Mississippi Valley Division; Rodger D. Harris, Program Development Office; Wanna E. Seay, Program Development Office. In addition August J. Smet, chief, Programs Division, Civil Works is representing the Chief of Engineers.

Senator BIBLE. Are you going to show pictures first, or make your statement first or are you going to coordinate?

General NOBLE. My statement will be coordinated with the slide presentation.

Senator BIBLE. Please proceed in your own way.

General NOBLE. I appreciate the opportunity to appear before you to describe the nature of the 1973 flood in the Lower Mississippi Valley. I will also cover the actions we took as the flood developed, the follow-on-actions required to repair and restore the project to preflood conditions, and the work required to be ready for the next flood season.

To lead off, I would like to briefly review the historic development of the Federal flood control program in the Lower Mississippi Valley.

MISSISSIPPI RIVER BASIN

The Mississippi, America's greatest river, has the third largest drainage basin in the world. It drains 41 percent of the 48 contiguous States. The basin covers more than 1,245,000 square miles, and includes all or parts of 31 States and two Canadian provinces.

It roughly resembles a funnel with its upper part spread across the Nation and with its spout at the Gulf of Mexico. Waters from as far east as New York and as far west as the Montana-Idaho line contribute to flows in the lower river.

Mississippi River floods are not a development of recent years. The Mississippi has always been a threat to the security of the valley through which it flows. It was discovered by DeSoto in 1541. De la Vega, in his history of the expedition, described the first recorded flood on the Mississippi as being severe and of prolonged duration. It began in March 1543 and lasted 80 days before the river returned to its banks. Indian legend, as told to the Spaniards, held that the Mississippi flooded almost every 14 years.

EARLY DEVELOPMENT OF FLOOD PROTECTION

Early settlers in New Orleans completed the first levee system about 1727.

The early flood protection in the Lower Mississippi Valley consisted primarily of levees, built mostly by local, and later State effort. It reached its highest point of development by local financing between 1851 and 1858, as a result of an Act passed on September 28, 1850, granting to the several States all swamp and overflow lands within their limits remaining unsold.

Senator BIBLE. Do they still belong to the States? The swamp and overflow lands, are they State lands? Has that changed over the years?

General NOBLE. They have sold them in the meantime. In other words, they took that land——

Senator BIBLE. It was State land and then they sold it to settlers. It was private ownership.

General NOBLE. Yes, sir, and with that money, they financed flood control works.

Senator BIBLE. I see. Thank you.

General NOBLE. The sale of these lands provided the financing for the flood protection work. The present State levee organizations were subsequently established. This gave some organization to the effort, but it was still primarily local and uncoordinated in nature.

The swamp act had been passed by the Federal Government to assist the States in the solution of the flood control problem. However, the inability of the States to carry out the purposes of the act made it evident that the Federal Government needed to assume greater responsibility for the protection of the valley against floods.

Mark Twain's, "Life on the Mississippi," carries the following:

> It has needed but little attention to make it perfectly obvious that the control of the Mississippi River, if undertaken at all, must be undertaken by the National Government, and cannot be compassed by States. The river must be treated as a unit; its control cannot be compassed under a divided or separate system of administration.
>
> Neither are the states especially interested nor competent to combine among themselves for the necessary operations. The work must begin far up the river; at least as far as Cairo, if not beyond, and must be conducted upon a consistent general plan throughout the course of the river.

By the year 1879 the need for improvement of the Mississippi River had become widely recognized. The necessity for coordination of engineering operations through a centralized organization had finally been accepted.

Mississippi River Commission

Accordingly, in that year, the Congress established the Mississippi River Commission and assigned it the duties to consider and mature a unified plan or plans and estimates as will correct, permanently locate, and deepen the channel and protect the banks of the Mississippi River; improve and give safety and ease to navigation thereof; prevent destructive floods; promote and facilitate commerce, trade, and the postal service.

In 1882, 3 years after establishment of the Commission, one of the most disastrous floods ever known devastated the entire delta area. The losses were appalling. During that flood there were hundreds of crevasses and the outlook for a permanent solution to flooding in the Mississippi Valley was disheartening.

The law creating the Mississippi River Commission required it to prepare plans to prevent destructive floods. However, for a number of years the appropriation acts restricted levee construction and repair to such work as would improve navigation on the river.

MAJOR FLOODS

In 1912, the valley was again devastated by a major flood. Most levees were still being built at local expense and were neither high enough, nor strong enough, nor located properly to retain the mighty Mississippi in flood time.

In 1913, another major flood comparable to that in the year preceding, hit the valley. These floods prodded the Federal Government into assuming a more prominent responsibility for flood control in the valley.

In 1917, Congress passed a landmark act providing for construction of a main line levee system in the interest of flood control. This was the real beginning of the present day levee and bank revetment program system.

In 1927, the river struck again.

The flood of 1927 was the most disastrous in the history of the lower Mississippi River Valley. An area of about 26,000 square miles was

inundated. Levees were breached, and cities, towns and farms were laid waste. Crops were destroyed, industries and transportation paralyzed. Property damage amounted to about $1½ billion at today's prices. Hundreds of lives were lost, and hundreds of thousands of people displaced.

FLOOD CONTROL ACT OF 1928

This disaster awakened the national conscience to the dire need for effective flood control in the lower valley. Out of it grew the Flood Control Act of 1928 which committed the Federal Government to a definite program for flood control. The present project dates from that act. Congress, in authorizing the Flood Control Act of 1928, recognized the huge expenditure of funds already made by local interests which is equivalent to over $2.6 billion at today's prices. The Congress considered the extent of national concern for the control of floods in the interests of national prosperity and interstate commerce. It took into account the gigantic scale of the project, involving staggering floodwaters flowing from a continental drainage area extending far beyond the States most affected. The Congress noted the uniqueness of this situation, and the fact that local treasuries and resources could no longer be relied upon to handle the problem. Subsequent legislation has resulted in many modifications to the 1928 act. These modifications have served to broaden and update the plan of flood protection. The present estimated Federal cost is $4.4 billion.

Under the Mississippi River and tributaries flood control plan, the plan adopted under the 1928 act, the concept of protecting the valley from flood by means of levees only was abandoned. It was recognized then, that to control the great volume of water associated with Mississippi River floods, a plan consisting of additional flood control features would be required. A comprehensive plan was developed. The prosecution of this plan involved one of the greatest engineering challenges in the history of the world.

The Mississippi River and tributaries flood control plan is designed to control the "project flood," which is the result of combining some of the most severe storms of record that have ever occurred in the valley and placing them in a pattern to produce the greatest flood having a reasonable probability of occurrence. The "project flood" would produce an estimated 3 million cubic feet per second flow at the latitude of Old River, half of which would pass down the leveed Mississippi River channel to the gulf; the other half down the Atchafalaya Basin.

ELEMENTS OF THE PLAN

The four major elements of the plan are: levees, floodways, channel improvements, and major tributary improvements.

The main levee system includes about 2,200 miles of levees and floodwalls. By the time of the 1973 flood, it was considered that 1,714 miles of these levees had been completed to what was then considered the proper grade and section. The remaining 416 miles were partially completed, but still deficient in grade or section.

The second element of the plan is the floodway system. We have four floodways in the M.R. & T. project, one in Missouri and three in Louisiana. However, only one of these, Bonnet Carre just above New Orleans, is complete.

Also, in the plan are channel improvements to stabilize the alinement of the channel and improve the flood-carrying capacity of the channel.

These improvements include cutoffs, bank revetments, dikes, and dredging.

By 1942, a total of 16 manmade cutoffs and two chutes had been completed, improving the efficiency of the channel by shortening its length by approximately 170 miles. These cutoffs lowered river stages about 16 feet at Arkansas City, 10 feet at Vicksburg, and 2 feet at Red River Landing.

The bank revetments consist of articulated concrete mattress extending to the deepest part of the channel. They protect the riverbank from the cutting action of the river currents. To date, 659 miles of a planned 968 miles have been completed.

The dikes direct the flow into desired alinements. We have completed 141 miles of a planned 296 miles.

The fourth element of the plan involves major tributary basin drainage and flood control improvements.

The M.R. & T. project as a whole is 41 percent complete. Much remains to be done, before the valley will be secure against the project flood.

With that background on the project plan, I will now turn to the 1973 flood.

FLOOD OF 1972–73

Senator BIBLE. That's what I'm particularly interested in.

General NOBLE. Over a continuous period of months, the Mississippi Valley experienced heavy rainfall, often torrential in nature, over a wide area. Almost all tributary basins were involved. We missed our low-water period completely last fall.

As a result of the incessant rainfall, flood control reservoirs along the tributary streams began to fill.

Fields became saturated, ponding areas were filled, and continuing rains could no longer be absorbed. Most of what fell became runoff.

In March, I reported to you, Mr. Chairman, that as early as last fall, a disturbing pattern began to take shape in the hydrograph readings at Cairo, Ill., the head of the alluvial valley. By December, the river was assuming a typical preflood pattern somewhat ahead of the stage developments which preceded the great flood of 1927.

Senator BIBLE. Was the flood of 1927, was that the all-time flood up to today?

General NOBLE. That's right, sir. It was the largest flood in the valley. As the 1972–73 river readings and general hydraulic conditions continued to follow the 1927 pattern, we began to prepare for a major high water, in accordance with the adopted plan for the control of floods in the lower valley.

I might add, Mr. Chairman, that the 1927 flood was the flood that precipitated the act of 1928, which set in motion the present Mississippi River and tributaries project.

Senator BIBLE. I wish you would comment on the effect of the Ohio River during the 1927 flood, as contrasted to the effect of the Ohio River in this year's flooding.

I have been told, I don't know whether it's right or wrong, that if the Ohio had misbehaved the way the Mississippi did, even the stalwart Corps of Engineers' projects wouldn't have been able to withstand the flood. I don't know whether that's right or wrong. But I wish you would comment on it as you go along.

General NOBLE. Yes, sir, I will.

PREPARING FOR A FLOOD

A comprehensive flood fight exercise was held in February 1973 throughout the Lower Mississippi Valley Division.

Next, we looked to our floodways to insure that all was in readiness for their use if required. Operation of gates was checked at Bonnet Carre, Morganza, and the overbank structure at Old River.

We also began dredging the forebay of the Bonnet Carre spillway to provide a more efficient entrance for floodwaters.

We degraded a low forebay levee at the entrance to the Morganza control structure, again to provide a more efficient entrance to the structure. As an additional readiness measure, we raised to authorized grade the low areas in the 11-mile upper fuse plug section of the Birds Point-New Madrid Floodway, on an emergency basis to provide authorized protection to that area.

As the water continued to creep upward, local levee boards and other agencies began closing gates in floodwalls, sealing manhole covers, and undertaking other preparatory actions.

Senator BIBLE. Would you pardon me just a moment? I think we need a quorum in the next room for the Committee on Appropriations.

I'll be right back.

[A brief recess was taken.]

Senator BIBLE. Please continue.

General NOBLE. We also began to warn those with interests in floodways to be prepared to evacuate if it became necessary to use the floodways, and we kept them abreast of the situation as the likelihood of use became more imminent.

MIDDLE MISSISSIPPI RIVER

I would like to touch on the middle Mississippi before we go into the lower Mississippi.

Senator BIBLE. Very well.

General NOBLE. The Mississippi went into flood stage at St. Louis on March 11, at about the time I was last before this subcommittee. In succeeding weeks, 39 non-Federal levees north of that city were breached or overtopped, inundating thousands of acres.

Unprotected, low-lying communities such as Grafton, Ill., were flooded.

South St. Louis areas along River des Peres were hard hit, and 300 buildings in historic St. Genevieve, Mo.—the oldest town west of the Mississippi River—were heavily damaged.

But the city of St. Louis itself, protected by a Federal floodwall, escaped damage from the greatest flood ever experienced on the middle Mississippi River.

The city of St. Louis project alone prevented in this one flood damages estimated at $343 million, more than four times the dollar cost of the project in that reach.

The only Federal work which did not provide adequate protection was the levee at Kaskaskia Island, near Chester, Ill., which was originally built in 1942, but which had not yet been constructed to the higher authorized grade because of a past lack of local interest.

LOWER MISSISSIPPI RIVER

Below Cairo, where the Ohio and middle Mississippi Rivers merge to create the lower Mississippi River, all Federal projects held and did their job, although I must confess there were times when I had grave concern.

Extensive tributary flooding occurred in Arkansas and Tennessee, such as we see here in Dyersburg, Tenn.

In Mississippi, the city of Greenwood was hit by a 10-inch rainstorm on March 15, causing extensive flooding of outlying subdivisions.

This storm, with the additional rainfall which the area experienced, filled the four reservoirs in the Yazoo River basin, sending water over three of the spillways for the first time since their construction.

So much water was held back in these reservoirs to help downstream areas, that it will take months to lower their water levels to the normal conservation level so as to regain the full flood storage capacity to handle future flood flows.

In this situation, to augment the protection of Greenwood, we raised 28 miles of Federal levees by using flashboards, mud boxes, earthworks, and other expedients on an emergency basis.

Senator BIBLE. Will a flashboard hold flooding conditions?

General NOBLE. A flashboard will give you a fighting chance to hold water, sir, and then you've got to get in there and shore it up. It's good against waves and things like that. It is not a durable, permanent flood protection measure.

Senator BIBLE. No, I didn't think it would be.

General NOBLE. It's the best you can do in an emergency.

Senator BIBLE. All right.

General NOBLE. More than 2.3 million acres of the Yazoo basin were flooded, either from Yazoo River headwaters, or by the Mississippi River backwaters. Some of the area is still under water.

The shaded area of the map is the approximately 900-square mile area north of Vicksburg that suffered from the backwater effect in March. The area enlarged subsequently as the flood stages rose.

Extensive backwater flooding was experienced in the unprotected portions of Catahoula Parish of Louisiana, known as the Red River Backwater area.

The relentlessly rising water eventually overtopped a Louisiana Department of Public Works levee near Jonesville despite a valiant flood fight effort to save it by the Tensas Levee Board with State and Federal assistance. An untimely wind whipped up a large wave action which undermined the efforts to raise the crown above the creeping water level.

An emergency ring levee was built by the levee board to protect the hospital, the airport, business firms, and nearby homes which have been located over the years outside the federally constructed levee around the city.

The backwater levee protecting Concordia Parish, La., kept more than 10 to 12 feet of water out of that area. We temporarily raised the fuse plug portion of that levee to prevent overtopping by wave wash.

Interior flooding, which has been a major problem in this area, would have been greatly alleviated if the pumping plant now in the planning stage had already been constructed.

INCOMPLETE PLANNING AND PROTECTION

The Lower Mississippi Valley is a dynamic hydraulic system still being changed by continuing physical processes.

We have learned a lot about our project during this flood. The incompleteness of the essential features of the project plagued us at every turn. The flood surfaced inadequacies that we didn't suspect existed.

DEFICIENT LEVEES

We had to raise more than 500 miles of project levees, 168 miles of which were mainline Mississippi River levees. Some levee reaches had never been brought to the authorized grade and others, such as in the Atchafalaya had subsided and needed to be brought back to grade.

We also determined that the flowline for the project flood, if it came this year, would be higher than the one upon which established levee grades had been based.

LOSS OF CHANNEL CAPACITY

In my statement to you last March, I indicated that the stage-discharge relationship at Vicksburg had improved over that of 1919. I pointed out that the stage was lowered by 5 feet, despite a much greater flow.

The slide indicates the history of channel capacity at Vicksburg. In 1919, stages were extremely high for the discharge indicated. In the 1930's, we implemented the cutoff program in the middle stretch of the lower river, which tremendously increased the channel capacity for that reach. This efficiency continued to improve until the channel reached its most efficient capacity about 1950.

Since 1950, we have gradually been losing channel capacity as the river attempts to regain its length. The channel stabilization program is designed to develop and hold the channel at its peak efficiency, but because of the magnitude of the undertaking, we have not been able to pursue it fast enough and we therefore lost some ground. The river since 1950 has regained 56 of the 170 miles it had been shortened in the middle reach by the cutoff program.

Discharge measurements made during the 1973 flood indicated that serious channel deterioration had taken place in this middle reach of the lower Mississippi since 1950. Our project flowline and hence our project levee grade had been established based on discharge measurements during the most recent high waters in 1945 and 1950, which happened to coincide with the period when the channel in this reach was essentially at the most efficient condition.

This resulted in establishing levee grades which were inadequate. Now, the channel at the present time is considerably more efficient than before the cutoffs, but it's not as efficient as it was in 1950.

ERRATIC FLOOD STAGE PATTERN

Another troublesome phenomenon which took place during the flood involved what we call the rating curve loop. This is the result of a falling river requiring a higher stage to pass a given volume of water than does a rising river. Referring to the slide; in this series of arrows, those in blue are the typical pattern for a rising river and the beginning of the fall.

The red arrows are the pattern for a hypothetical continued fall. However, if a new rise begins before the loop closes on itself, as shown in yellow, the new pattern will have higher stage values than before. And you end up in this situation with three or four different stages for the same discharge.

This was the result in an actual situation, as we trace the river through its seemingly erratic pattern at Vicksburg. The river passed 900,000 second feet on January 2, at a stage of 32 feet. It subsequently passed the same amount at stages of 33 and 34 feet.

The river wavered again in mid-April, as you see up there near the end of the line—the red line—we had three different stages for a flow of 1,750,000 cubic feet per second; stages ranging from about 48 feet to 50 feet.

This 2-foot difference resulted in much additional flooding in the Yazoo backwater area, so you can see how serious this rating curve loop became in this flood. Some floods, like the 1937, had a fairly smooth rise and fall. 1973 had successive rises, exaggerating the loop effect.

PROJECT FLOWLINE

Because of the loss of the capacity and because of the stages reached in 1973, the project flood flowline will require substantial raising. We have analyzed the levee profiles, using our Mississippi River model at Clinton, Miss., and our mathematical computer programs. We have projected a new flowline based on the 1973 flood date. Substantial increases in the height of our levees will be required.

Returning to an earlier slide, here, you see the changes for the Mississippi River, from below Memphis to Baton Rouge. Most of the deficiency is in the middle portion of the Lower Mississippi. At Arkansas City the increase in the project flowline is about 4½ feet; at Vicksburg about 5½ feet. It then begins to taper off to an increase of about 1 foot at Baton Rouge.

The Atchafalaya River levees will also require substantial increases in height. As you know, the Atchafalaya Basin is required to carry half of the flow in a project flood. The range of increase in levee height required will be from 2 to 4 feet.

Backwater levees will also have to be raised compatible with the increased stages of the project flood flowline.

LEVEE GRADE INCREASES

In all, over 800 miles of M.R. & T. levees will have to be raised from 1 to 5½ feet to provide the authorized protection against a project flood.

Senator BIBLE. Who is responsible for this? Is that a Corps responsibility?

General NOBLE. Yes, sir.

Senator BIBLE. All right.

General NOBLE. The rainfall throughout the basin had to travel to the lower part of the river. This meant that once water got into one of the tributaries or the main stem, it had to be contended with for a considerable period until it could be led out safely to the gulf.

FLOOD CREST TRAVELTIME

This traveltime can be critical depending on how the contributions from each contributing basin combine as they course their way down to the gulf. Two or more crests coming together on the main stem give higher stages than if they follow one another.

By manipulating discharges from dams on tributary streams, we can regulate the flows to prevent major surges on various tributaries from concentrating in the Lower Mississippi at the same time. Spreading out these tributary contributions can greatly reduce the stages. And we did this throughout the flood by coordinating with the adjacent division engineers, Missouri River division in Omaha and Southwestern division in Dallas.

Of course, during this traveltime, rain will usually occur at a number of places throughout the valley, and add to the stages.

This traveltime has one good aspect. It permits a little time to take actions to prepare for water which is known to be on its way.

Senator BIBLE. Before you go to that slide, would you back up to preceding slide? What is that 40 and 35?

General NOBLE. Those are days.

Senator BIBLE. They are what?

General NOBLE. The water at the place of one of those little tags, takes 25 days for it to get down to the gulf. Where it's 30, it takes 30 days to get down there.

Senator BIBLE. Oh, I see the legend down there explaining flood crest traveltime, and days above New Orleans.

General NOBLE. It gives you an idea of how long you worry about that water.

Senator BIBLE. Thank you.

BONNET CARRE FLOODWAY

General NOBLE. This accounts for some anticipatory actions we have had to take, the reasons for which were not immediately obvious in the immediate vicinity at the time. Thus the shrimp fisherman on Lake Pontchartrain, looking at the 18.3 gage reading in New Orleans, gave his views to a newspaper reporter that I really didn't have to open Bonnet Carre when I did on April 8.

What he didn't know was that had we not acted, the river stages would have gone above 20 feet, endangering the safety of New Orleans and downstream areas.

OLD RIVER STRUCTURES

One critical problem we have had to live with throughout the flood came about on Thursday, April 12, when a wing wall at the Old River low-still structure collapsed. A troubling eddy pattern was set up by

the disturbed flow pattern of the water at the entrance to the structure.

You notice there, Mr. Chairman, all we have lost at this point was just the tip, and the eddy pattern began right there. Shortly after that, we lost the whole wing wall. This wing wall is not an integral part of the rest of the structure, and is not important in itself.

However, the loss of that wing wall with that volume of water going through there set up a very bad eddy, which was scouring away in the vicinity of the dike and the structure.

Senator BIBLE. What are the dimensions of those wing walls?

General NOBLE. They're about 17 stories high.

Senator BIBLE. Seventeen stories high.

General NOBLE. They normally stand about 125 feet by 80 feet for each.

Senator BIBLE. Now, the purpose of that wing wall is what?

General NOBLE. To guide the water.

Senator BIBLE. It's just to guide the water?

General NOBLE. To straighten out the water to get it into the structure so that it has smooth entrance and provides for maximum hydraulic efficiency of the structure itself.

Senator BIBLE. Very good. I understand that now.

General NOBLE. An infrared photograph shows the turbulence of flow through this structure. A failure of the low-sill structure would have given us an uncontrolled discharge into the Atchafalaya Basin, and threatened the integrity of the flood control system below Old River.

To reduce velocities through the low-sill structure and to raise the tailwater behind it we opened the overbank structure at Old River. The overbank is the long one, the low sill is the one further up there with the turbulent water.

On April 17, to further help the low-sill structure, we partially opened the Morganza Floodway. This lowered the headwater at the low-sill structure. By raising the tailwater, and lowering the headwater, the discharges and velocities of flow through the structure were reduced. This acted to relieve the damaged structure.

We also started building a rock dike to break up the eddy pattern. All these steps were designed to reduce the attack of the river on the structure.

Because of the eddy pattern, the powerful currents dug a deep scour hole just upstream from the structure. We had to stop this attack by means of the rock dike and by dumping rock into the scour hole.

Now, it took a while for us to take this reading. The water was so turbulent, we couldn't get in there to do this. And it was only after we took all these extraordinary actions to lower the velocities, that we were able to get in there and find out the damage that had been done.

The Old River control structure will have to be rehabilitated. The vicious attack of the Mississippi River during the 1973 flood has left this structure in a weakened condition. The structure, in its present condition, is not safe, nor is it sufficiently flexible as designed to allow the most effective control of flows approaching a project flood.

COST OF RESTORATION

Senator BIBLE. Will you comment on that later, and how many dollars you will have to secure in order to get back where it is safe?

General NOBLE. We have a request for emergency funds, sir——

Senator BIBLE. Are you able to do that within appropriated funds?

General NOBLE. No, sir. We will not be able to.

Senator BIBLE. Then you're going to ask this committee to put in x dollars to take care of it?

General NOBLE. Yes, sir, we expect to.

We have two things to do; we have, first, to repair the structure so we can face additional floods. In order to do that, we have prepared a model—this is the picture of it—to see how we have to repair it to survive additional floods.

In the longer term——

Senator BIBLE. That repair is the short-range remedy?

General NOBLE. That's the short range; in the longer term, I believe we're going to have to replace it. That money—we have made no request for it at this time.

Senator BIBLE. How about the short range? Is it in the fiscal year 1974 budget in your flood control emergency account?

General NOBLE. It would be in the emergency account. It's being considered now in the Department.

Senator BIBLE. Is that in the supplemental, that's been requested?

General NOBLE. No, sir, the supplemental covers fiscal year 1973 emergency moneys.

Senator BIBLE. That was only 1973?

General NOBLE. Yes, sir.

Senator BIBLE. We do not have a request as yet for 1974. That's what I was getting at.

General NOBLE. No, sir, you do not have a request as yet.

Senator BIBLE. What's the range of that request in dollars?

General NOBLE. It's $105 million for the Mississippi River Basin; about $100 million of which is for the Lower Mississippi Valley Division, and a part of that is for the low sill structure.

Senator BIBLE. Will we have a budget request for that before we get to marking up this bill?

Mr. SMET. I think there may be one. We are in negotiation with the Secretary of the Army's Office for possible submission of a budget amendment. The money involved for flood control emergencies for the Mississippi amounts to about $105 million, and we have some other amounts required also, that may be requested at that same time.

Senator BIBLE. We'll probably be dealing with this bill, I suppose, about the middle of July.

Will that be forthcoming by then?

Mr. SMET. We are hoping that it will be; yes, sir.

Senator BIBLE. Because we have two ways that we can handle that as I see it, either in the regular appropriations bill, or if it doesn't get up here in time, on the first supplemental, which will be later on in this year.

Mr. SMET. We find there are advantages if it could be obtained in an amendment, of course, because then we are in a position immediately to start using it, if we work under a continuing resolution.

Senator BIBLE. Now, come again?

Mr. SMET. If we have a continuing resolution for the utilization of civil works funds, and if the money is in a budget amendment, we could be in a position to start utilizing the added money as early as July rather than November or December.

Senator BIBLE. Well, that depends upon you, because this is obviously a need that has to be met, and I would hope we could meet it at the earliest possible date. I don't see how we can meet it if we don't get a budget request for it, that's what I'm saying.

Mr. SMET. Yes, sir.

Senator BIBLE. All right.

ATCHAFALAYA BASIN

General NOBLE. Prior to opening Morganza, we had begun to raise low sections along the levees in the Atchafalaya Basin and the floodwalls in the Morgan City-Berwick area of Louisiana.

As I mentioned earlier, our flood control project is financially less than half complete, although physically it is somewhat further along. It still was not ready for a flood of 1973 proportions. We had to raise the incompleted protection works by emergency temporary works to have a fighting chance to cope with this flood, which could easily have grown to project flood levels. A number of times during the past several months, it appeared that such a flood could be imminent.

The Morgan City-Berwick area was hard hit during the flood. Extensive flooding took place outside the protected areas, as a result of torrential rain and high tides. The main city areas themselves were protected by Federal levees and floodwalls, and remained dry.

However, since the works had not yet been raised to the authorized level, it was necessary that they be raised on an emergency basis to full authorized height.

To provide additional skilled manpower and heavy equipment, we requested engineer troop support. The 5th Army sent two reinforced companies of the 62d Engineer Battalion to Morgan City from Fort Hood, Tex.

These soldiers worked on the wall and in the water to shore up the protection for that area.

We had to scout the whole South to obtain sufficient heavy-gage sheet piling to raise long reaches of levee in the Atchafalaya Basin, where poor foundation conditions would not permit a buildup with earth. All of this work was extremely urgent, and was conducted on an accelerated basis. Operations were around-the-clock in most cases.

Here, the Atchafalaya sheet pile wall is completed, and you can see we got it up just in time. The water is already on it, and it subsequently got up higher on the wall.

Senator BIBLE. But it performed its function?

General NOBLE. It performed; yes, sir.

Senator BIBLE. All right.

RIVER BANK FAILURES

General NOBLE. We have experienced several Mississippi River bank failures in Louisiana. These are to be expected, and we watch for them very diligently.

The first of these occurred at Montz, near Bonnet Carre, where currents and eddies eroded a sand layer beneath the bank, and 600 feet of bank slid into the river, threatening the main line levee. You will note the new levee on the right of the slide. To give you an example of cost, Mr. Chairman, this cost about $3 million.

The next major problem developed at Nairn, in the downstream part of Plaquemines Parish. Again a sand layer was eroded and a 200-foot section of levee, extending into the crown, sloughed off into the river.

An immediate setback was required. It was completed in 3 days, and you can see the new levee being built at the land-side of the old levee.

Shortly thereafter, a major trouble spot developed 3 miles below the city of Plaquemines, La. This was another bank-erosion problem requiring another levee setback. The gap in the free line to the left indicates where the bank slippage occurred.

The latest slide has developed on the west bank of the Mississippi River about 2 miles below Algiers' lock and below the heavily developed residential area of New Orleans. The slide was about 100 feet in length and extended about one-half the way up the slope of the levee. A setback is presently underway.

Based on experiences during the fall of previous highwaters, it is to be expected that additional slides may occur, threatening levees along the lower river where battures are narrow.

CROP LOSSES

The most serious effect of the flood has been the extended flooding of agricultural lands. There will be a late planting season with substantial reduction in such cash crops as cotton, soybeans, sugarcane, and rice. In some instances, 2 crop years will be lost because of the slow runoff of impounded waters.

Senator BIBLE. What will I find the condition of this area to be if you and I were to go there today?

General NOBLE. A considerable part of it would still be under water.

Senator BIBLE. It would still be under water.

General NOBLE. It's coming off very slowly.

Senator BIBLE. Very well.

DAMAGES

General NOBLE. The losses, while very serious, could have been worse. Had the project failed, the losses would have been catastrophic. The area in blue on this map shows the flooded areas, approximately 13 million acres in seven States.

At this time, we estimate actual damages of $409 million, not including the emergency flood fight and restoration work of the Corps. The area in yellow is the additional land that would have been flooded had our flood-control works not been in place.

More than 10 million additional acres would have been flooded, including just about all of the major population and industrial centers in the lower valley. Losses would have easily exceeded $7.7 billion, dwarfing the 1927 disaster by comparison.

COMPARISON OF FLOODS

No one element in the integrated flood control system works independently. All elements interplay, and all these elements have to be considered throughout the exercise over and over again in the decisionmaking process.

Throughout this trying period, the Mississippi River Basin model at Clinton, Miss., has been an invaluable tool in this decisionmaking process. We depended on it continuously throughout the flood crisis in assembling the facts and data needed to make day-to-day decisions.

OHIO RIVER EFFECT ON MISSISSIPPI FLOODING

To go back to the project flood chart, Mr. Chairman; I would now like to—this chart shows, in proportion, the contributions of the various tributaries to what we call the project flood; the flood upon which our project is based. And you'll notice the major contribution of the Ohio River, as you pointed out earlier, to the project flood.

If you get a visualization, that's the Ohio coming in, and you come down the lower river and when you get down about where Morganza is, the river flow divides in half—one-half of the project flood comes down the main river, and the other half, less than half, but it combines with what comes out of the Red, making another half which goes down the Atchafalaya.

Now, out of this, I would like to superimpose the 1973 flood, to give you an idea of how the two compare. Now, you will note, up around the St. Louis area, we had a flood of record, and it is larger—the 1973 flood is greater than the project flood contribution. The Ohio, as you pointed out, is considerably less. The Ohio was only 12 percent above normal: whereas other tributary basins were as much as 70 percent above normal in rainfall.

Senator BIBLE. The Ohio was how much above normal?

General NOBLE. It was 12 percent; 12 percent above normal. So it's contribution to the 1973 flood was less than it could have been.

The upper Mississippi River contributed more, as did the Missouri; the Arkansas, about the same, but it was capable of much more.

In 1927, the Arkansas contributed over 800,000 second feet.

Senator BIBLE. How much did the Ohio contribute in the 1927 flood?

General NOBLE. I've got the 1927 flood superimposed also. The big flood on the Ohio, Mr. Chairman, was the 1937 flood. The 1927 on the same chart looks like this.

Now, 1927 had a number of crevasses, so it had water running all over the place, but the water that was contained within the project is shown in green on this map; so that people that were in and around these towns on the river saw that much water.

So, you see, in many respects as far as the observer on the banks is concerned, they saw more going by in 1973 than in 1927. In 1927, the river got loose; in 1973, it did not.

Now, Mr. Chairman, I show on this slide a blue strip. That blue is the effect of stage discharge relationship.

As I said earlier, these flood stages were perched for several reasons, so the effect of that perching really added stages equivalent to the project flood, and it made it much higher as far as the levees were concerned, and that's what we had to face.

Now, you can see it, down around New Orleans; we have project flood water down there, and we diverted the rest of it down the Atchafalaya. The Atchafalaya had record flows. They have never had that much water down the Atchafalya, but it did not approach project flood proportion.

FLOOD FIGHT SUMMARY

We took all that flood fight to hold this flood in check and in the Corps of Engineers alone almost 2,000 men and women of the Lower Mississippi River Valley Divsion worked full time and sometimes around-the-clock. We were augmented by more than 200 employees of other Corps divisions, and by more than 400 active Army troops.

We have strengthened or raised on an emergency basis more than 500 miles of Federal levees along the Mississippi and its tributaries, and in that regard, we got into some real mass production work. In this case, we had contracted to put up our mud boxes, but we were building the mud boxes at the same time—we built them in our workshops, assembled them, shipped them out on our barges, got them down to the levees, and laid them down on the levees.

The contractor came along, erected them, put them together, filled them, and staked them down so that the high rising water wouldn't push them off the levee.

We have issued more than 10 million sandbags. We loaned and operated hundreds of pumps throughout the valley, assisted in the flood evacuation, and in local flood fighting efforts where the problem was beyond the capacity of local interests.

We have granted several hundred contracts for work to supplement the effort of our own people.

OTHER AGENCY INVOLVEMENT

I would like to mention the splendid efforts of the State and local agencies in the flood fight and the cooperation and assistance of other Federal agencies—the U.S. Coast Guard, the Office of Emergency Preparedness, the U.S. Weather Service—to name a few. Without exception, all public agencies worked together for the public good. The Red Cross and other relief agencies were found everywhere helping victims.

RESTORATION AND REPAIR PROGRAM

We have a large restoration program on our hands. We should move forward on an expedited basis to repair the flood damage to all flood control structures as soon as flood conditions permit in the various reaches of the river. This program will include repair of damage to levees from scour, wave wash and slides. It will include repair to levee slope paving and the construction of levee setbacks where required by bank recession.

Some drainage structures through levees were removed or closed off during the flood. They will have to be rebuilt or rehabilitated.

We expect to find or encounter considerable damage to revetments

and foreshore as the river falls. Removal of silt deposited in the navigation channel during the flood is going to be a costly and an urgent expenditure. An indication of the magnitude of the problem is pointed out by the fact that is was necessary to initiate dredging to maintain a 9-foot channel in some areas of the river when the project was still in flood.

RAISING DEFICIENT LEVEES

In addition to the repair of damages and the extraordinary maintenance, we must raise the most deficient levees without delay. Mud boxes and excessively high potato ridge levees—these are the little dirt levees that we can put together in an emergency. They cannot be relied upon to withstand another flood. Threatened levee reaches must be secured, where banks are undermined.

We should undertake construction of the most critical portions of this work now. As much of this work as humanly possible should be completed before the next high water season which normally starts in December.

FREQUENCY OF FLOODS IN LOWER MISSISSIPPI VALLEY

I have been asked when we can expect the next flood to occur. This is a complicated question. Probably the best way to answer it is to call to mind the frequency of major floods in the Lower Mississippi Valley since the formation of the Mississippi River Commission in 1879.

Beginning with the great flood of 1882, we have had 14 floods in a timespan of 91 years, or an average of 6½ years apart. The floods of 1912, 1913, 1916, 1922, and 1927 came as close as 1, 3, 6, and 5 years apart. Going back even further, over the last 191 years, these great floods have occurred on the average of about 7 years apart. They are not rare occurrences, but are a normal condition in the Lower Mississippi Valley.

That concludes my statement, Mr. Chairman.

1973 FLOOD DAMAGE

Senator BIBLE. That's a very fine presentation, General. Now, what is the total overall damage that was attributed to the 1973 flood on the Mississippi and its tributaries, in dollars?

General NOBLE. We have estimated, sir, $409 million, not counting our emergency work.

Senator BIBLE. Why don't you count in your emergency work?

General NOBLE. I don't have it in there, but I can put it in there: $409 million damage and our current and projected emergency work of $152 million; including everything the total would be $561 million.

Senator BIBLE. That $152 million is related to what? Just to repairing the damage? It doesn't take care of the repairs that you——

General NOBLE. Fighting and restoring, yes, sir.

Senator BIBLE. That takes care of the restoration that will put the levees and the structures back into shape, the same shape roughly as they were before the flood?

General NOBLE. Yes, sir; as far as we can now estimate it.

Senator BIBLE. I understand, you're talking about $222 million, and how much of that have you received—$103 million was the supplemental.

And how much do you have in the 1974 budget related to this problem?

General NOBLE. We don't have anything. The 1974 budget was put together before the flood.

Senator BIBLE. Oh, before. I see.

General NOBLE. That's what Mr. Smet was talking about, that we have now within the Corps the consideration——

Senator BIBLE. And you hope to get a budget amendment for that. We have the House report before us.

HOUSE ALLOWANCE

What amount did the House committee allow for it?

General NOBLE. They didn't allow anything for it, sir, but in this current supplemental, there was some emergency allowed in that.

Senator BIBLE. We allowed $103 million for that. That's up on the floor today—the conference report.

General NOBLE. Some of this is for other parts of the country, and only part of that would be——

Senator BIBLE. I see. So in your amendment or supplemental, you're talking in the range of what?

Mr. SMET. The conference action has been taken on the supplemental in the amount of $103 million for flood control and coastal emergencies, and that one is the bill that is hung up on the Cambodian rider.

Senator BIBLE. That's right. I think it's due up in the House of Representatives this afternoon. I believe.

General NOBLE. That's for 1973, sir.

Senator BIBLE. That's right.

FLOOD CONTROL EMERGENCY

General NOBLE. And the total requirement for 1974, as I understand it, Corpswide, is $119 million.

Senator BIBLE. So when we receive an amended or supplemental budget request, it will be in that approximate amount of money. Is that right?

General NOBLE. Yes, for flood control emergency money.

Senator BIBLE. For emergency money.

General NOBLE. I do want to point out, Mr. Chairman, that these emergency moneys will not do anything to raise levees that need to be raised beyond the point where they were. In other words, the emergency moneys will not advance the project.

BUDGET REQUEST FOR MONEY TO ADVANCE THE PROJECT

Senator BIBLE. Is there anything in the regular 1974 budget request that does advance the project?

General NOBLE. Yes, the regular 1974 budget does have money to advance the project, but it does not advance these things that have been surfaced by the flood, that really need to be looked at very carefully before we encounter another flood.

Senator BIBLE. Are you asking for that; will that be part of the supplemental or the amended budget request?

General NOBLE. We have that under consideration.

Senator BIBLE. But that's not ready yet?

General NOBLE. No, sir, nor is it an approved concept yet, sir.

Senator BIBLE. And that will be an approved concept by, optimistically, July 15 through 20; or is that too optimistic?

Mr. SMET. We would hope that it would be an approved concept by then, yes, sir.

Senator BIBLE. All right. I always appreciate you men and your hopes, but is it a realistic one? We'll be off all the month of August. Will it be realistic in September?

Mr. SMET. I think that will depend upon the attitude of the Office of Management and Budget and the administration.

Senator BIBLE. Yes, we've heard those words before. We'll ask the staff to keep track of this, because you do have a great need here for additional dollars. You say you have to have this by December 1?

General NOBLE. No, sir. We ought to start this work now, because we don't have very much time. We should have finished that by December 1.

Senator BIBLE. Oh, it should be done by December 1.

General NOBLE. As much as we can finish should be done by December 1. This means we should start now. To start now, we need the money now. In order to get the money now, as Mr. Smet pointed out, the only conceivable way we can think of is an amended budget because were the committee and the Congress to add in the normal way, it wouldn't be available until this fall.

Senator BIBLE. I know. You want an amended budget to your regular 1974 budget request for public works. That's what you're saying.

General NOBLE. The only procedural way for us to have the money now, as we see it, will be to have an amended budget. Then the continuing resolution, you see, will apply to that amount.

Senator BIBLE. I understand what you are saying. Can you plead that case before OMB?

General NOBLE. We are working on it, Senator. We are talking to the Secretary of the Army.

Mr. SMET. It hasn't gone to the Office of Management and Budget yet.

Senator BIBLE. Well, if you men are to make a case, and you make a good case, you've got to move as fast as you can because I can understand what you're saying; you want this in the way of an amended budget request, and the regular fiscal year 1974, and not as a first supplemental to 1974.

All right. The monkey is on your back. So hop to it.

RAINFALL IN MISSISSIPPI VALLEY

Now, General Noble, what was the comparative rainfall in the Mississippi Valley, and all the tributaries that feed into the Mississippi, year-by-year? Hasn't this been about the heaviest rainfall that you've had in that entire Mississippi area for many years?

General NOBLE. Yes, sir.

Senator BIBLE. You can supply that for the record?

General NOBLE. Yes, sir.

[The information follows:]

Year or flood season [1]	Normal rainfall (in inches)	Actual rainfall (in inches)	Percent (+) above normal (−) below normal
UPPER MISSISSIPPI BASIN			
1973	14.9	22.3	+50
1972	14.9	16.1	+8
1971	14.9	11.7	−21
1970	14.9	14.9	0
1969	14.9	13.8	−7
1968	14.9	15.9	+7
1967	14.9	15.9	+7
1966	14.9	13.9	−7
1965	14.9	15.9	+7
1964	14.9	14.8	−1
1963	14.9	11.9	−20
1962	14.9	15.8	+6
1961	14.9	13.9	−7
1960	14.9	17.7	+9
1959	14.9	13.2	−11
MISSOURI RIVER BASIN			
1973	11.4	19.4	+70
1972	11.4	13.4	+18
1971	11.4	10.7	−6
1970	11.4	11.2	−2
1969	11.4	13.1	+15
1968	11.4	10.0	−12
1967	11.4	9.2	−19
1966	11.4	7.4	−35
1965	11.4	11.1	−3
1964	11.4	10.4	−9
1963	11.4	7.6	−33
1962	11.4	13.1	+15
1961	11.4	12.5	+10
1960	11.4	13.7	+20
1959	11.4	9.8	−14
OHIO BASIN			
1973	21.5	24.2	+12
1972	21.5	20.9	−3
1971	21.5	19.8	−8
1970	21.5	20.8	−3
1969	21.5	19.1	−11
1968	21.5	20.0	−7
1967	21.5	20.2	−6
1966	21.5	18.8	−13
1965	21.5	21.8	+1
1964	21.5	20.7	−4
1963	21.5	20.3	−6
1962	21.5	22.4	+4
1961	21.5	20.8	−3
1960	21.5	22.4	+4
1959	21.5	18.9	−12
TENNESSEE-CUMBERLAND BASIN			
1973	29.9	39.3	+31
1972	29.9	28.7	−4
1971	29.9	29.0	−3
1970	29.9	27.9	−7
1969	29.9	27.4	−8
1968	29.9	27.6	−8
1967	29.9	23.7	−21
1966	29.9	19.4	−35
1965	29.9	31.0	+4
1964	29.9	32.1	+7
1963	29.9	32.3	+8
1962	29.9	41.0	+37
1961	29.9	29.0	−3
1960	29.9	30.2	+1
1959	29.9	21.5	−7

Year or flood season [1]	Normal rainfall (in inches)	Actual rainfall (in inches)	Percen (+) above normal (−) below normal
ARKANSAS RIVER BASIN			
1973	12.3	80.9	+151
1972	12.3	14.5	+18
1971	12.3	8.9	−28
1970	12.3	12.9	+5
1969	12.3	17.7	+44
1968	12.3	13.0	+6
1967	12.3	7.7	−37
1966	12.3	11.0	−11
1965	12.3	13.0	+8
1964	12.3	8.1	−34
1963	12.3	6.0	−51
1962	12.3	13.0	+6
1961	12.3	15.2	+24
1960	12.3	14.3	+16
1959	12.3	7.9	−36
WHITE RIVER BASIN			
1973	24.1	40.5	+68
1972	24.1	19.2	−20
1971	24.1	16.2	−33
1970	24.1	22.7	−6
1969	24.1	22.8	−5
1968	24.1	22.1	−8
1967	24.1	16.0	−34
1966	24.1	16.3	−32
1965	24.1	18.8	−22
1964	24.1	20.4	−15
1963	24.1	14.2	−41
1962	24.1	21.4	−11
1961	24.1	17.8	−26
1960	24.1	21.4	−11
1959	24.1	14.2	−41
RED RIVER BASIN			
1973	19.1	24.8	+30
1972	19.1	18.7	−2
1971	19.1	11.6	−39
1970	19.1	22.1	+16
1969	19.1	21.4	+12
1968	19.1	19.9	+4
1967	19.1	10.7	−44
1966	19.1	22.0	+15
1965	19.1	16.0	−16
1964	19.1	17.3	−9
1963	19.1	13.7	−28
1962	19.1	22.3	+17
1961	19.1	20.8	+9
1960	19.1	21.6	+13
1959	19.1	18.0	−6
LOWER MISSISSIPPI BASIN			
1973	29.9	43.1	+44
1972	29.9	28.2	−6
1971	29.9	26.4	−12
1970	29.9	25.8	−14
1969	29.9	31.8	+6
1968	29.9	27.6	−8
1967	29.9	23.2	−22
1966	29.9	31.0	+4
1965	29.9	30.3	+1
1964	29.9	34.6	+16
1963	29.9	18.4	−38
1962	29.9	33.6	+12
1961	29.9	33.0	+10
1960	29.9	25.1	−16
1959	29.9	23.5	−21
1958	29.9		

[1] 7 mo: Oct. 1 through Apr. 30.

General NOBLE. It was very different in that it was not only heavy and sustained, but it was widespread, almost every tributary flooded.

Senator BIBLE. I think it's an interesting statistic if it can be computed without too much trouble; because not only did you have a flood, you had the continuous rainfall to make your problem just that much more difficult.

General NOBLE. And one thing that it did, is made a very serious problem of interior flooding within the protected works, so the protected areas that did not have pumping plants suffered as a result.

Senator BIBLE. Your backwater damage, I suppose, was something—probably the most you ever had of backwater damage, wasn't it?

General NOBLE. At least of my experience.

Senator BIBLE. I don't know whether you can break it out into that type of comparison or not. But——

General NOBLE. Yes, sir. We have. For example, in the Yazoo Basin, we had damages from backwaters, $60 million and we had 9,500 people evacuated and 860 farms were damaged by backwater from the Mississippi.

Senator BIBLE. General, would you please describe the flood situation today?

General NOBLE. The Mississippi River crested at Cairo, Ill., at 55.7 feet on April 2, 1973, and at New Orleans at 18.4 feet on April 7, 1973. Bonnet Carre Spillway was opened on April 8, 1973, or the stage would have exceeded 20 feet. Since these crests, the river has fluctuated up and down. At present, except as noted below, it is falling and is within banks from Cairo, Ill., to Natchez, Miss. Below Natchez the river is still out of banks and it will be several weeks before it is within banks all the way down to New Orleans. The Atchafalaya River at Morgan City, La., is above flood stage and falling very slowly.

The recent rains in the Ohio and Tennessee Basins and in the Upper Mississippi area have caused the Upper Mississippi and the Ohio Rivers to rise slightly with a resulting small rise at Cairo.

In the Yazoo Basin, the river is within banks above Yazoo City but is still out of its banks from Yazoo City down to Vicksburg. The Red River is falling and is well within banks down to below Alexandria.

The Ouachita River is falling and is also within banks. The same is true of the Arkansas River.

The Black River, which is affected by the Red River backwater area, is still above flood stage and there is still extensive flooding in the Red River backwater area. This is also true in the Yazoo backwater area.

In the leveed areas which do not have pumping plants, the gravity drains have been opened and the impounded seepage and rain water is draining off slowly. In one instance—East Cape Girardeau—the levee has been breached in order to expedite the evacuation of impounded water.

All spillways and flood control structures that were operated during the flood have now been closed as follows:

Bonnet Carre—All 350 gates closed.

Morganza—124 of the 125 gates closed. The one remaining gate has been left open to drain the forebay area.

Old River overbank structure—All 73 gates have been closed.

Old River low sill structure—All 11 gates remain open. The low sill structure runs open at all times. The low sill structure acts to divide the flows between the Lower Mississippi and the Atchafalaya at all stages of the Mississippi River.

All pumping of flooded areas by the Corps of Engineers has been discontinued.

Flood fight activities throughout the Lower Mississippi Valley division have been drastically reduced but surveillance of levees and bank conditions by both Corps and levee board personnel, particularly in the area below Natchez where the river is not yet within banks, continues. The threat of levee failures from sloughing banks will continue until the falling river approaches normal stages.

LIVES LOST

Senator BIBLE. How many lives were lost because of the flood, and how many people were displaced?

General NOBLE. Thirty-five lives were lost and 39,000 persons were displaced.

DAMAGE PREVENTION

Senator BIBLE. You indicated in your opening statement that $7.7 billion in damages were prevented by Corps projects during the flood. What are the total damages prevented by the Mississippi River and tributaries project during the flood and to date?

General NOBLE. We estimate that during the flood $5.8 billion in damages have been prevented by the Mississippi River and tributaries flood control works in place.

Total cumulative damages prevented to date by the Mississippi River and tributaries project amount to $14.6 billion.

Senator BIBLE. General, the main stem system functioned without a failure and provided the protection it was designed to give, and I feel that you and your organization are to be congratulated. Yet, we have had thousands of people driven from their homes; farms out of production for the crop year; and many millions of dollars in damage. As far as the Mississippi River and tributaries area is concerned, this was from backwater flooding in the tributaries was it not?

General NOBLE. Yes, sir, that is true. There was also significant flooding in the headwater areas of the tributaries.

Senator BIBLE. The subcommittee is deeply concerned about the human misery that has resulted from this flooding, and we are anxious to do what is possible to give these people protection as soon as it can be done. Please tell the subcommittee which tributary areas caused the most actual human suffering during these floods, from the point of view of evacuation from their homes, property damage, and loss of the use of their farms.

General NOBLE. Yazoo Basin, Tensas Basin, and the St. Francis Basin.

CAPABILITY OF CORPS

Senator BIBLE. For each of those areas you have named, what is your full capability?

General NOBLE. Subject to the proper qualification, our full capability for the Yazoo Basin is $9,050,000 which is $5,450,000 over the budget request. For the Tensas Basin our capability is $10 million

which is $6,230,000 over the budget request. For the St. Francis Basin our capability is $15,500,000 which is $3 million over the budget request.

Senator BIBLE. In terms of giving protection as soon as possible to the people who were actually hurt—not threatened but actually hurt—by this great flood, is there any place in the M. R. & T. area where additional money could accomplish more than it could in these tributary areas?

BACKWATER AREA

General NOBLE. No, sir, we consider the backwater area of the tributaries of very high priority.

Senator BIBLE. Could you estimate for the committee the number of people permanently residing in the backwater areas?

General NOBLE. Yes, sir. Based on the 1970 census, there are 26,600 persons living in the Yazoo backwater area and 22,600 persons living in the Tensas-Cocodrie Loop of the Red River backwater area.

1974 PROSPECTS

Senator BIBLE. General, from your statement it is evident that you have a serious problem with much work to be done in a short time. Would you tell us the work that you feel is urgent and should be accomplished in fiscal year 1974?

General NOBLE. Yes, sir. First, we must repair and restore damaged flood control works including the Old River low sill structure. We must begin right away to raise deficient levees to authorized grade and section—working first to replace temporary mud boxes and "potato ridge" levees which are over 2 feet in height. We expect that extensive channel stabilization works on the Mississippi River and Atchafalaya River will be required and work on our tributary streams where flooding was severe should be accelerated. In addition, we expect extraordinary maintenance requirements as the water recedes.

Senator BIBLE. Would all of this work be done with emergency rehabilitation funds?

General NOBLE. Flood control and coastal emergency funds will be used to repair and restore damaged flood control works including the Old River low sill structure. Works which will advance the project and the additional maintenance will be accomplished with Mississippi River and tributaries funds.

Senator BIBLE. What is the Corps' requirement in fiscal year 1974 for repair and restoration of damaged flood control works under the flood control and coastal emergencies appropriation?

General NOBLE. Over and above the $103 million supplemental for fiscal year 1973 agreed to in conference. I understand the total Corps' requirement for fiscal year 1974 is $119 million and of this amount $105 million is for the Mississippi River basin flood.

Senator BIBLE. Now, the $105 million—is it needed just to repair and restore damaged flood control works?

General NOBLE. Yes, sir, that is correct.

Senator BIBLE. Are these emergency funds included in the fiscal year 1974 budget request?

General NOBLE. No, sir.

CURRENT EXPENDITURES AND ESTIMATED COSTS

Senator BIBLE. How much has been spent thus far in fighting the flood?

General NOBLE. Sir, approximately $47 million by the lower Mississippi Valley division.

Senator BIBLE. General, you indicated that 800 miles of levees would have to be raised several feet. What would be the cost to raise these levees?

General NOBLE. Sir, our preliminary estimate of the additional cost to the project is $615 million. Of this amount $304 million is for Mississippi River levees, $202 million is for Atchafalaya River levees, and $109 million to raise backwater levees in the Yazoo and Red River basins.

Senator BIBLE. Earlier, you said you should begin right away to raise deficient levees and advance other critical features of the Mississippi River and tributaries project. Can this work be accomplished within the fiscal year 1974 budget amount and, if not, how much additional funds would you need?

General NOBLE. No, sir. The amount required is too great to be absorbed within the present budget amount. After making all feasible adjustments, we would need an additional $62 million over the budget amount of $110 million.

Senator BIBLE. When would you need to start the work?

General NOBLE. We need to proceed now. Our ability to accomplish the work during the low-water season is contingent upon early receipt of the necessary funds.

Senator BIBLE. You say it is contingent upon early receipt of funds. When do you need to receive the funds?

General NOBLE. Sir, we need the funds in July.

FLOOD AND COASTAL EMERGENCIES REQUIREMENTS

Senator BIBLE. Would you please furnish for the record a tabulation detailing the additional requirements over the budget request you have outlined for both the flood control and coastal emergencies and the Mississippi River and tributaries appropriations?

General NOBLE. Yes, sir.

[The information follows:]

Additional fiscal year 1974 flood related requirements including adjustments to features

Flood control and coastal emergencies:	
Mississippi basin flood	$105,000,000
Flood control, Mississippi River and tributaries:	
Advance engineering and design:	
Eastern Rapides, south-central Avoyelles Parishes, La	−220,000
Reelfoot Lake—Lake No. 9, Tenn. and Ky	+150,000
Subtotal A.E. & D	−70,000

Construction:	
Mississippi River levees	+28,866,000
Channel improvement	+7,000,000
Old River	+1,000,000
Atchafalaya basin, Louisiana	+10,000,000
Cache basin, Arkansas	−500,000
Lower White River, Clarendon levee, Arkansas	−246,000
Tensas basin, Arkansas and Louisiana:	
Red River Backwater area, Louisiana	+4,000,000
Yazoo basin:	
Tributaries (except Ascalmore-Tippo and Opossum Bayous)	+1,090,000
Ascalmore-Tippo and Opossum Bayous	+100,000
Big Sunflower River	+400,000
Yazoo backwater	+1,710,000
West Tennessee tributaries	−350,000
Subtotal construction	+53,070,000
Flood control, Mississippi River and tributaries:	
Maintenance:	
Mississippi River levees	+1,000,000
Revetments and dikes	+3,000,000
Dredging	+4,000,000
Atchafalaya basin	+1,000,000
Subtotal maintenance	+9,000,000
Total flood control, Mississippi River and tributaries	+62,000,000
Total flood related requirements	+167,000,000

YAZOO BASIN

Senator BIBLE. Senator Stennis, the chairman of this subcommittee, has introduced a resolution for consideration by the Public Works Committee requesting a review of the Yazoo basin feature of the project. With adequate authority, what is your capability to start this study, and what would be accomplished with the funds?

General NOBLE. Subject to the proper qualifications, our capability is $100,000. With the funds we would hold public meetings, initiate the development of a plan of study and initiate environmental inventories.

Senator BIBLE. With the emergency funds provided in the supplemental, and the operation and maintenance money provided in the budget request, how will you stand with respect to being able to restore the main stem system to its preflood condition?

General NOBLE. Sir, the emergency funds to be provided in the supplemental are to cover the cost of flood fight operations during fiscal year 1973. Additional funds in the amount of $105 million will be required in fiscal year 1974 to repair and restore damages from the Mississippi River flood. Also, it is anticipated that extraordinary maintenance needs not covered by these emergency funds or the budget will amount to an additional $9 million for the Mississippi River and tributaries project.

Senator BIBLE. How long will it take to do this?

General NOBLE. Sir, all of the work should be done as soon as possible. The major portion must be accomplished before the next high water season which normally starts in December.

Senator BIBLE. When the restoration is completed, could you presumably be able to pass a flood of similar magnitude to the one this year?

General NOBLE. Yes, sir, we probably could be employing extraordinary emergency measures similar to those used in the flood fight this year.

PROJECT DESIGN FLOOD

Senator BIBLE. How did this flood compare with the project design flood?

General NOBLE. The project flood is 3 million cfs at the latitude of Old River. This year we had about 2.3 million cfs at Old River, or about 700,000 less than the project flood. However, because of the elevated river stages, the 2.3 million cfs had the effect of a considerably larger flow.

In the St. Louis, Mo., area we had an all-time record. In the Mississippi River below Old River we experienced the project flood while in the Atchafalaya basin where something less than the project flood was experienced, record river stages were reached in the lower Atchafalaya basin, including the Morgan City-Berwick area.

Senator BIBLE. You have new hydrology in many areas. Would it be appropriate to review previous reports on those areas to determine what project modifications should be authorized?

General NOBLE. Yes, sir.

Senator BIBLE. What other general investigations under Mississippi River and tributaries would you give a high priority as a result of your flood experience?

General NOBLE. In addition to the Yazoo basin, high priority should be given to the Atchafalaya basin, La., study and to the East Bank levees, Mississippi River, Tennessee, and Kentucky study.

BACKWATER FLOOD DAMAGES

Senator BIBLE. In your capacity as Division Engineer of the Lower Mississippi Valley Division you have as one of your four district offices the St. Louis District, which is outside the Mississippi River and tributaries project but had severe flood damages. What was the flood situation there with respect to backwater flooding on the tributaries?

General NOBLE. Sir, I would like to submit for the record a tabulation of damages which occurred as a result of backwater flooding in the St. Louis District.

[The information follows:]

River	Acres flooded	Damages	Type of area
Des Peres	710	$16,400,000	Urban.
Meramec	50,000	2,000,000	75 percent urban, 25 percent rural.
Big Muddy	20,000	600,000	Rural.
Salt River	10,000	2,000,000	Do.
Illinois	96,000	5,500,000	Do.
Kaskaskia	80,000	3,000,000	Do.
Total	756,710	29,500,000	

Sir, I would also like to point out that considerable damages occurred as a result of interior flooding.

Senator BIBLE. General, would you state for the record your capability in the backwater areas as well as the areas where interior flooding was a problem?

General NOBLE. Sir, in general we do not have any authorized projects which would alleviate flooding due to backwater. Subject to the proper qualification, I will provide a list of our capabilities with respect to interior flooding.

[The information follows:]

Project	Budget	Capability	Purpose
East St. Louis interior flood control, Illinois	$600,000	$1,500,000	Complete planning and initiate construction.
Harrisonville and Ivy Landing, Illinois	0	150,000	Initiate construction.
Kaskaskia Island, Illinois	0	80,000	Initiate planning.
McGee Creek, Illinois	0	400,000	Initiate construction.
Mississippi River Agriculture Area No. 8, Missouri	0	190,000	Continue planning.
Coloumbia D & LD No. 3, Illinois	0	150,000	Initiate construction.
Perry County	0	80,000	Initiate planning.

ST. LOUIS DISTRICT CAPABILITIES

Senator BIBLE. In review of reports in these areas, what are your capabilities for fiscal year 1974?

General NOBLE. Sir, we have no outstanding authorized studies for backwater in the St. Louis district. Subject to the proposed qualification I will list capabilities on outstanding flood control studies in the St. Louis district.

[The information follows:]

Study	Budget	Capability	Purpose
Cape La Croix Creek, Cape Girardeau, Missouri	0	$25,000	Initiate study.
Chouteau Island L & LD, Illinois	0	15,000	Do.
Crooked Creek, Illinois	0	15,000	Do.
East Cape Girardeau and Clear Creek, North Alexander, Clear Creek, Preston and Miller Pond D & LD, Illinois.	$30,000	90,000	Continue study.
Kaskaskia Island, D & LD, Illinois	30,000	40,000	Do.
Miller City and vicinity, Illinois	0	15,000	Resume study.
Mississippi River above Missouri River	0	15,000	Do.
Mississippi River, Old Channel, Mi. 111 to 117, Illinois and Missouri.	0	15,000	Initiate study.
St. Louis metropolitan area, Missouri and Illinois	400,000	1,000,000	Continue study.
Ste. Genevieve, Missouri	0	15,000	Initiate study.
Silver Creek, Illinois	35,000	180,000	Continue study.

NORTH COUNTY LEVEE DISTRICT L–15 UNIT, MISSOURI RIVER LEVEE SYSTEM

Senator BIBLE. What can be done to alleviate the flood situation at the juncture of the Missouri and the Mississippi Rivers? Do you have a capability on this?

General NOBLE. The principal project in that area is the North County Levee District L–15 unit of the Missouri River levee sys-

tem. That project falls within the area of responsibility of the Missouri River Division Engineer. I understand that available funds will be adequate to continue planning of the L–15 unit in fiscal year 1974, and that there is no additional capability.

Senator BIBLE. I want to congratulate you on the fine work that you continuously do, and you certainly have done an outstanding piece of work in my judgment from what I know about it on the lower Mississippi, the entire Mississippi, as a matter of fact. So we'll do the best we can, and I just again emphasize the one thing we need more than anything else is that amended budget request.

So I think we all understand each other, General Noble, and we'll try to be helpful. Under the present scheduling, I assume we'll try to mark this up in the subcommittee about July 12, I am told; and probably in the full committee about the 18th or 19th.

We hope to complete this by August 1, our work on the fiscal year 1974 Public Works appropriation, but I don't know if we can take it to conference, or out of conference and get it done. So anything you can do to be of assistance to us, particularly on this amended budget request, should be considered in light of that timetable that we're trying to impose on ourselves.

General NOBLE. Thank you, Mr. Chairman.

SUBCOMMITTEE RECESS

Senator BIBLE. The hearing stands in recess until 2 p.m., tomorrow.

[Whereupon at 3:03 p.m., Monday, June 25, the subcommittee was recessed, to reconvene at 2 p.m. Tuesday, June 26.]

PUBLIC WORKS APPROPRIATIONS FOR FISCAL YEAR 1974

TUESDAY, JUNE 26, 1973

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 2:05 p.m., in room S–126, the Capitol, Hon. Alan Bible presiding.

Present: Senators Bible, Pastore, Hatfield, Young, Stevens, and Bellmon.

ATOMIC ENERGY COMMISSION

STATEMENT OF DR. DIXY LEE RAY, CHAIRMAN

ACCOMPANIED BY:

JAMES T. RAMEY, COMMISSIONER
DR. CLARENCE E. LARSON, COMMISSIONER
WILLIAM E. KRIEGSMAN, COMMISSIONER
ROBERT E. HOLLINGSWORTH, GENERAL MANAGER
L. MANNING MUNTZING, DIRECTOR OF REGULATION
JOHN P. ABBADESSA, CONTROLLER
JOHN J. FLAHERTY, ASSISTANT GENERAL MANAGER
MAJ. GEN. EDWARD B. GILLER, ASSISTANT GENERAL MANAGER FOR NATIONAL SECURITY
DR. JOHN M. TEEM, ASSISTANT GENERAL MANAGER FOR PHYSICAL RESEARCH AND LABORATORY COORDINATION
M. C. GREER, ASSISTANT CONTROLLER FOR BUDGETS
V. CORSO, DEPUTY CONTROLLER
JAMES W. CULPEPPER, DEPUTY ASSISTANT CONTROLLER FOR BUDGETS
F. P. BARANOWSKI, DIRECTOR, PRODUCTION AND MATERIALS MANAGEMENT
MAJ. GEN. F. A. CAMM, ASSISTANT GENERAL MANAGER FOR MILITARY APPLICATION
DR. G. W. JOHNSON, DIRECTOR, APPLIED TECHNOLOGY
DR. R. L. HIRSCH, DIRECTOR, CONTROLLED THERMONUCLEAR RESEARCH
DR. R. W. WOOD, CHIEF, PHYSICS AND INSTRUMENTATION BRANCH, DIVISION OF BIOMEDICAL AND ENVIRONMENTAL RESEARCH
R. D. O'NEILL, DIRECTOR, OFFICE OF CONGRESSIONAL RELATIONS

SUBCOMMITTEE PROCEDURE

Senator BIBLE. The hearing will come to order.

As you know, the purpose of this recall hearing is to discuss with the Federal agencies the various requests for increases in budget amounts, new starts for planning and construction, and other matters as well as to consider objections raised by witnesses to certain programs and projects; and also to give the agencies an opportunity to comment on the House action to date.

The House Committee on Appropriations has reported the Public Works-AEC appropriation bill, H.R. 8947, and the recommendations are contained in the report which, I believe, each of you have.

First, we have today the Atomic Energy Commission, and the principal witness will be the Chairman, Dr. Dixy Lee Ray.

Doctor, I am happy to see you. The record will show the list of AEC witnesses who are accompanying you. You may proceed with your comments.

Dr. RAY. Thank you, Senator.

BUDGET REQUEST

Mr. Chairman, Senator Pastore, my colleagues and I are pleased to appear before you to discuss further the Atomic Energy Commission's budget request for fiscal year 1974.

To summarize briefly the current status of our fiscal year 1974 budget, we requested appropriations totaling $2,430 million, of which $1,755 million was for Operating Expenses, and $675 million was for Plant and Capital Equipment. On June 14, 1973, the Joint Committee on Atomic Energy reported authorization bills to the House and Senate providing for appropriations about $56 million less than our request. Yesterday, the House Appropriations Committee reported a bill to the House providing appropriations about $131 million less than our request.

We are particularly mindful of the desires of both the President and Congress for fiscal restraint and of the need to make hard choices in the ordering of our national priorities. We are dedicated to these objectives and, accordingly, we are limiting our appeal to this committee to $17.7 million for our weapons program, $2 million for our regulatory program, and $6.1 million for related changes in selected resources for a total restoration of $25.8 million.

WEAPONS PROGRAM

With regard to our weapons program, the Joint Committee made a reduction of $50 million. The committee directed that $15 million be applied against the production of specific weapons systems and $35 million be applied as a general reduction, stating "* * * it is expected that the reductions would be made in such a manner as to minimize any adverse impact on the weapons laboratories." The House Appropriations Committee made a further reduction of $17.7 million and directed that $15.1 million be applied against the testing activity.

In order to accommodate the JCAE reduction of $50 million and to comply with the committee's direction, we allocated $37.8 million against weapons production, $11.1 million against the testing activity,

and only $1.1 million against R. & D. activities at the laboratories. In view of these reductions, we do not have any alternatives we consider acceptable for absorbing the additional $17.7 million reduction made by the House Appropriations Committee.

We would first like to note that the reduction of $11.1 million we have already allocated to testing as part of the JCAE $50 million reduction would appear to satisfy the essential intent of the House guidance to reduce that activity. That is the testing activity. It is also significant that since funding for the testing activity provides for laboratory salaries and associated procurements, this allocated reduction has already had an adverse impact on the weapons laboratories.

If the Commission were to accept the House Appropriations Committee recommendation to reduce testing by an additional $15.1 million (for a combined reduction of $26.2 million), the result would be a total reduction of about 50 percent in number of tests from the proposed fiscal year 1974 program which was already reduced 40 percent from the average level of the 5 prior years. At such a level of testing, we would seriously compromise the Limited Test Ban Treaty Safeguard A (the requirement to conduct a comprehensive, aggressive underground test program) which we regard as an unacceptable consequence.

If we allocated most or all of the additional reduction of $17.7 million recommended by the House Appropriations Committee against R. & D. activities in the weapons laboratories, we would violate the guidance provided in the JCAE authorization report to minimize any adverse impact on the weapons laboratories. Such an action would cause a further reduction of approximately 600 laboratory scientific and technical personnel from a level already reduced from the fiscal year 1973 level by about 600 in the AEC fiscal year 1974 budget submission and by about 250 as a result of the JCAE reduction. This would represent a total reduction of about 10 percent in lab employment from fiscal year 1973. Of particular concern to us is that such a reduction would seriously affect the capabilities of the major national resource represented by the weapons laboratories, would erode significantly our support of Limited Test Ban Treaty Safeguard B (the requirement to maintain modern nuclear laboratory facilities and programs), and would, in our view, be contrary to the national interest.

REGULATORY PROGRAM

With regard to our regulatory program, the House Appropriations Committee made a $2 million reduction and directed that it be applied against contractual services. Our request for contractual services to support our regulatory activities totals $19.4 million. Of this amount, $11.8 million is in direct support of our licensing activities, $2.9 million is for our safety and environmental standards activities, $3.3 million is for our operations and inspection activities, and $1.4 million is for administrative support.

The reduction recommended by the House Appropriations Committee would directly impact our efforts to reduce the time required for licensing, safety and environmental reviews of nuclear central station plants which are critical to this Nation's electrical energy needs. as well as to reduce the support of our efforts to develop standards

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for and insure proper construction and operation of these plants. Such an impact would not be consistent with our priority needs in these areas as we attempt to build a strong, independent regulatory capability, nor with the priority of our regulatory program in relation to the Nation's energy needs.

We recognize that there is a significant increase in the amount being requested for our regulatory program in fiscal year 1974. However, as I explained to this committee at our hearings earlier this year, the July 1971 *Calvert Cliffs* decision relative to the National Environmental Policy Act resulted in a very heavy workload in the preparation of environmental impact statements. This effort, along with the continually expanding workload associated with new applications for construction and operation of nuclear power reactors and licensing of nuclear fuels and materials activities, as well as our efforts to strengthen regulatory's independent technical and administrative capability requires the full amount of funding which we requested.

EFFECT OF HOUSE ACTION

In summary, the House reductions total $131 million, of which we are requesting restoration of $25.8 million in operating costs—$17.7 million for the weapons program and $2 million for our regulatory program—plus $6.1 million for related changes in selected resources.

We will be pleased to answer any questions you may have.

APPEALS TO HOUSE ACTION

Senator BIBLE. Now, what is the total restoration request, $25.8 million?

Dr. RAY. Yes, sir.

Senator BIBLE. That is the total amount including the various weapons programs, the regulatory activities and related changes in selected resources?

Dr. RAY. Yes, sir.

Senator BIBLE. Senator Pastore?

Senator PASTORE. That $131 million House reduction, Dr. Ray, represents the $50 million that we cut in your authorization, too, doesn't it?

Dr. RAY. Yes, sir.

Senator PASTORE. So the House cut, of course, is $131 million less $50 million?

Dr. RAY. That is correct.

Senator PASTORE. Now, with reference to the reduction in the regulation activity, $2 million that the House cut, what was the original amount that was asked by the Commission of OMB?

Dr. RAY. $59.9 million.

Senator PASTORE. How much did they allow?

Dr. RAY. $54.5 million.

Eenator PASTORE. So OMB had already cut you $5.4 million; is that correct?

Dr. RAY. Yes.

Senator PASTORE. What does that do to you? Most of this is for personnel, isn't it?

Dr. RAY. That is correct. The impact is not so much on staff personnel entirely on the AEC payroll but also on that kind of activity which is termed contractual services, such as the laboratory support for environmental statements and license reviews and things of that sort.

Senator PASTORE. Give us an example.

Dr. RAY. All right, the actual amount that was cut impacted upon 102 people in the regulatory programs plus——

Senator PASTORE. 102 people.

Where would they be housed, within the agency itself?

Dr. RAY. That is correct.

Senator PASTORE. Now, how many people do you have in the regulatory program to begin with?

Dr. RAY. At present we have 1,143. The requested 1974 level is 1,393.

Senator PASTORE. Well, that 1,393 is based upon calculation?

Dr. RAY. That is the estimated staffing in 1974; yes. That is up from 1,143 at the present time.

Senator PASTORE. Now, Mr. Ash cut you by how many employees?

Dr. RAY. 102.

ENVIRONMENTAL IMPACT STATEMENTS

Senator PASTORE. Now, tell us a little bit about this example that I asked you, Dr. Ray, tell us a little bit about what you mean by contractual services and the environmental situation. How do you go about that?

Dr. RAY. May I ask Mr. Muntzing——

Senator PASTORE. Ask anybody here so it becomes clear on the record.

Mr. MUNTZING. Senator Pastore, we use the Oak Ridge National Laboratory, the Argonne National Laboratory, and the Battelle-Pacific Northwest Laboratory to prepare technical data for the environmental impact statements. These three groups have been supporting us. We do that with contractual services dollars as opposed to direct AEC personnel and that is one reason why the contractual services dollars are substantial.

Senator PASTORE. But this is no new theory, is it, Oak Ridge?

Mr. MUNTZING. No, sir. We are funding their efforts to support our work in the environmental area which is new since 1971. There was a backlog——

Senator PASTORE. How serious is the backlog?

Mr. MUNTZING. It really has come down so that we in the coming fiscal year with the funds we requested should be on a pretty current basis. In the past we have had plants sitting there built and unused. We have had tremendous periods of time for construction permits, some as long as several years. In the next fiscal year with the funds we have requested we would expect to meet the objective of having no plants sitting there built and unused because we haven't finished the environmental work. We would also expect for construction permits that the review time by the staff would come down to approximately 12 months, plus the hearings, and that the environmental matters would not become the pacing items, but to do that we must have these contractual services dollars which we have requested

for 1974 in order that the support from the laboratories can continue and that we can meet those objectives.

Dr. RAY. I could add just a little bit to that.

Between the years 1970 and 1973 with the additional funds that have been provided, there was a reduction in the time required to process construction permits from 35 months to 18 months, almost in half. For operating licenses the time was cut from 37 months to 23 months.

Mr. Muntzing believes that for the 1974–75 period we expect to reduce the staff review time to 12 months from the present 15 months for construction permits. The total construction permit time would then average about 16 months.

Senator PASTORE. On another matter you request restoration of $6.1 million for related changes in selected resources.

What does that mean?

Mr. ABBADESSA. Senator Pastore, that is additional obligational authority associated with the increases we have asked for. We have asked for restoration of $17.7 million in operating expenses for weapons and $2 million for regulation, but when our contractors order supplies and make contracts they have to have contracting authority that will go beyond the amounts of our appeal to cover their commitments; that is their undelivered orders at the end of the fiscal year. This is obligational authority only, it will not be expended this year, and when the items are delivered next year we include them in our budgeted program costs presented to you.

Senator PASTORE. What happens if you don't get it?

Mr. ABBADESSA. The figure you are looking at is called change in selected resources and it is a residual figure. To the extent we are short, it affects our contractors' ability to keep going in the next fiscal year.

Senator PASTORE. Now, you say of the $17.7 million, 11-something is for testing, $11.8 million?

Dr. RAY. The $11.8 million is for licensing activities, $2.9 million is for safety and environment study activity, $3.3 million is for operation and inspection, $1.4 million is for administrative support.

Senator PASTORE. Now, how much of the cut goes toward the testing program? I think you have that on the first page—$15.1 million; is that right?

Dr. RAY. Yes.

Mr. ABBADESSA. The figures which the chairman just read relate to contractual services for the regulatory program, Senator.

WEAPONS REDUCTION

To get back to the weapons reduction, we have applied the joint committee reduction of $50 million in accordance with the guidance we received. The joint committee told us to close up the artillery fired atomic projectile, which together with the House guidance to not restart the 61 bomb, results in a $37.8 million reduction against weapons production.

The joint committee told us to apply it so that we have minimum impact on the weapons laboratories, so only $1.1 million went against research and development which is carried on in the laboratories. The balance, $11 million, went against testing.

WEAPONS TESTING

Now, the House committee said to reduce $17.7 million more, of which $15.1 million should go against testing. Since we have already applied a significant amount against testing, we are appealing the House committee's cut.

Senator PASTORE. Now, just for the purposes of the record, what kind of testing is anticipated in fiscal year 1974?

Dr. RAY. May I ask General Camm to answer?

Senator PASTORE. By the way, is there any person in here not authorized to be here? Everyone is cleared?

Mr. JONES. Yes, sir.

General CAMM. We are planning to do the same sort of testing that we have done in previous years in terms of underground tests at Nevada, and they will be only at Nevada. Because of the reductions in the amounts of money for testing already in the 1974 congressional budget, and as a result of the joint committee markup, we have had to reduce the number of tests [deleted].

Senator PASTORE. The argument is constantly made that we keep stocking up. I am being the devil's advocate, don't misunderstand. We are stocking up and stocking up, and you get to a point of no return. You keep testing. What are we testing for?

General CAMM. We are testing to do two things. One is to improve the types of weapons that we have now.

For example, it has been estimated that the improvement that we will make in the warhead for the Trident submarine, once it comes along, [deleted] could result in savings of perhaps as much as $1 billion in the overall cost of the system. Because we are making a smaller warhead, this requires a smaller missile to deliver it to the distance [deleted].

So there is an economic reason.

Senator PASTORE. To Trident. What else?

[Deleted.]

Senator BIBLE. Further questions from Senator Pastore?

Senator PASTORE. No, that is all.

Senator BIBLE. Senator Hatfield?

TEST TREATY

Senator HATFIELD. May I just ask the question if there is any relationship to the recent agreements just concluded by the President and the U.S.S.R. to your request for restoration of these funds above the House figure?

Dr. RAY. No, sir, the test treaty, limited test treaty to which we abide, provides for a certain amount of underground testing. This is not only for improvements but occasionally, I think, also for checking stockpile and so on, but mostly for development.

Now, over the past 5 years, we have had an average number of [deleted] tests each year. In the proposed budget for 1974, as reported by the Joint Committee, the funds would provide for only about half that number, [deleted] and with the additional cut of $17.7 million applied to this program as reported from the House, there would be a further significant reduction in the number of tests that would be possible to undertake during the coming year.

Senator HATFIELD. I have one other question and that is relating to the applied energy technology program.

Dr. RAY. Yes, sir.

Senator HATFIELD. I believe, according to the House report, that they restored that or they put back into that $4.2 million?

Dr. RAY. Yes, sir.

Senator HATFIELD. Of which $2 million is for the isotopes program.

I have a particular interest in that area because I think it is one of the nonmilitary areas in which the Commission has really shown some fantastic leadership.

What is the capability, is that the $2 million figure, or is there a higher figure that would be more fitting to your capacity or capability?

Dr. RAY. I am sure there is a higher figure, and I will depend on Mr. Abbadessa to find it, that would provide for better use of existing facilities at Brookhaven Laboratory and Los Alamos. The accelerators at these facilities are in use and are providing a great deal of interesting information. The $2 million additional would allow us to construct target materials where the beams could actually be used for impacting targets to produce isotopes which then would be available for experimental work, particularly in the field of health and medicine.

Senator HATFIELD. I see the House specifically addressed itself to $4.2 million, $2 million figure increase to be for the production and development of medical radioisotopes.

Dr. RAY. Yes, sir.

Senator HATFIELD. I would like to know, though, frankly if we could make more use of additional funds in this particular medical area or the isotope area generally?

Mr. ABBADESSA. In the medical isotope area, Senator Hatfield, that was the Commission's request.

Senator HATFIELD. $1.2 million?

Mr. ABBADESSA. That is correct. In the other area, the figure that is in the President's budget for overall isotopes program is $2.2 million.

The Joint Committee took testimony and added $3.7 million which would give us the total program of $5.9 million which is generally our 1973 level. It is a fair statement we have a capability at that level. The House added the $2 million in lieu of the $3.7 million, and I think it is a fair statement that we have the capability at the President's requested level of $2.2 million, the House level at $4.2 million, or the JCAE level at $5.9 million. Our current level is $5.9 million.

Senator HATFIELD. Your capability is $5.9 million, or your present level is $5.9 million?

Mr. ABBADESSA. Yes, sir.

Senator HATFIELD. But your capability is $5.7 million, is that what you said?

Mr. ABBADESSA. No, I think our capability is certainly the amount of our going level.

Senator HATFIELD. $5.9 million?

Mr. ABBADESSA. Yes, sir.

Senator HATFIELD. So if we were to reach that level, then, if the Senate saw fit to increase over the House, we would be talking about what increase?

Mr. ABBADESSA. Well, I think, sir, your limit that you could increase would be the Joint Committee authorization.

Senator BIBLE. What is that?

Mr. ABBADESSA. $3.7 million.

Senator HATFIELD. $3.7 million. So we are talking about $1.7 million that could conceivably be added by the Senate to be within the authorization?

Mr. ABBADESSA. Yes, sir.

Senator BIBLE. That would be within the authorization; is that right?

Mr. ABBADESSA. That is correct.

Senator HATFIELD. Thank you very much.

Senator BIBLE. Senator Bellmon?

REGULATORY PROGRAM

Senator BELLMON. Thank you, Mr. Chairman.

Dr. Ray, I am sorry I was a little late in getting in. I arrived as you concluded your testimony. If I understood you right, as I read your comments on page 4, the restoration of $2 million to your regulatory program would hasten the licensing and the construction possibility of electrical generating plants. Is that what you were saying?

Dr. RAY. This is our belief. I can break the figure down.

Senator BELLMON. Would you, please?

Dr. RAY. We would propose to apply $500,000 to licensing. Specifically, this would be for——

Senator BELLMON. $500,000 of the $2 million?

Dr. RAY. Yes, sir; that is right—for providing technical assistance from the laboratories to particularly the environmental impact statements. If it were not restored, it would cause the length of time for the environmental reviews to be stretched out. We are trying to cut down the amount of time. With the additional $500,000, we figure the review can be made in about 9 months. Without it, the time would stretch out to 12 months.

An additional $800,000 would go to the fuel cycle licensing. This has to do, first, with assistance from the AEC Laboratories. About $300,000 of that is for contracts for studies, tests, and analysis for licensing of fuel cycle activities, production, and transportation. This would increase the backlog of fuel cycle licensing reviews, if it were not restored, from about 8 months to a year or more for that portion of the licensing process.

Then in the important area of standards, producing standards, we would apply $700,000 there. If this money were not available, it would reduce the contractual work in the laboratories and delay production of guides for the uranium and plutonium measurement methods and for the technical standards for siting of nuclear facilities, which has always been a considerable problem. The main effect is not of either stopping or starting any activity but the length of time it takes to perform these very vital functions.

Senator BELLMON. Well, it has been my impression, based on the hearings we had in the Interior Committee last year, that there is an almost critical need for accelerating the development of nuclear power generation facilities.

Dr. RAY. Yes, sir.

Senator BELLMON. Could you tell this subcommittee whether or not the atomic power generating plants are sort of on schedule or are we behind, do we need to accelerate getting these plants onstream?

Dr. RAY. Following the *Calvert Cliffs* decision, there was an enormous backlog and essentially a hiatus for some 17 months in being able to issue construction permits and operating licenses due to the necessity to provide environmental impact statements. Now, from that time to this, there has been an enormous catchup activity as well as an effort to get onstream so that the operating license work would all be done by the time the plant is constructed and ready to operate—so that we would no longer have a plant sitting there already constructed and unable to operate because the safety reviews and environmental reviews and so on had not been done.

Our aim is to bring down the length of time for conducting these reviews, to 12 months or less, and considerable progress has been made toward that.

I think Mr. Muntzing could give you some figures, if you like, specifically on numbers of plants that are in the process now and average length of time it takes now to process these licenses.

Mr. MUNTZING. Yes, Senator, the figures show that because of the environmental considerations at that time the licensing stopped for a 17-month period of time; and as we looked at the average time to issue a decision, it was something in the order of 35 months. Since then, with the support of this committee and others we have reduced that time so that we are now looking at an average time in the area of 18 months, and it is our hope that this will continue to decline. It is unfortunate when you see plants built and not licensed, sitting there unused. It is unfortunate when we see that the review time at the early part, construction review part, is taking an inordinate amount of time. So these resources are designed to bring those times down to the very minimum time required. In the process, we must insure safety and we must maintain the quality of environmental reviews. We do not want to sacrifice quality, but we do think it must be done in a timely fashion, and that is the reason why it does take more resources.

Senator BELLMON. I have no further questions.

Senator BIBLE. Senator Young?

Senator YOUNG. Just one question.

COOPERATION AGREEMENT WITH THE SOVIET UNION

As I understand the agreements that we just reached with the Soviets, we will cooperate with them on a greater reactor program. Just how would we work with them, what do we have to gain, and how would we gain?

Dr. RAY. We would expect to do a good deal more exchange of information with respect to the fast breeder program. Although both nations have given high priority to the liquid metal fast breeder, our approach has been somewhat different, and the Soviets are ahead of us in the actual construction of a plant. Our approach has been more deliberate. We are doing a great deal more basic research, safety testing, and component testing before we actually put the demonstration plant together.

There is a good deal that can be learned from each other's experience. In general, that is the area in which we are particularly interested so far as the fast breeder program is concerned. Mr. John Flaherty, who is in charge of that general area, might add a few comments.

Mr. FLAHERTY. Chairman Ray is referring to the fact that the Russians have constructed a 600-megawatt electrical plant on the fast breeder principle, and this agreement that we have entered into with them specifically provides that we will have access to information from that plant. Our scientists may visit and study that plant, and in return for this, of course, we will have Soviet scientists visiting ours. This is the principal cooperation that is involved.

Senator YOUNG. Thank you.

Senator BIBLE. Senator Stevens?

GEOTHERMAL ENERGY DEVELOPMENT

Senator STEVENS. Dr. Ray, have you asked for restoration of the $4.7 million that I am informed was deleted by the House committee relating to geothermal energy development?

Dr. RAY. That is not included presently. As you know, the figure was included by the Joint Committee.

Senator BIBLE. There is nothing in this budget as of now, if I might interrupt, for geothermal steam; is that a correct statement?

Dr. RAY. Yes.

Senator HATFIELD. I believe this was cut by OMB rather than the House committee?

Mr. ABBADESSA. The Commission requested $4.7 million, OMB cut it out.

Senator HATFIELD. To zero?

Mr. ABBADESSA. To zero. It was not in the President's budget but the Joint Committee added the $4.7 million and the House committee again zeroed it out, so Senator Bible is correct, as of this moment there are no funds in our budget.

Senator PASTORE. The House committee didn't include it?

Mr. ABBADESSA. They did not.

Senator HATFIELD. It was authorized by the Joint Committee?

Senator PASTORE. Authorization is not the appropriation. The appropriation bill had not gone to the Appropriation Committee. The point is that the administration did not request any money for it although we authorized it and they, the House committee, did nothing about following the authorization. They did not add it. They didn't cut it out.

Mr. ABBADESSA. Senator Pastore is correct. A better statement would certainly be, at this point, we have $4.7 million authorized. We do not have any money appropriated, however.

Senator PASTORE. How do you feel about it?

Dr. RAY. Sad.

[Laughter.]

Senator PASTORE. Would you rather have it?

Dr. RAY. Yes, sir.

Senator PASTORE. OK.

Senator STEVENS. May I ask that we get some justification in this record for the $4.7 million showing what they will do with that money? I am very interested in that geothermal effort.

Senator BIBLE. I think a number of us are and I was going to ask a series of questions along that line, if you would yield for a moment.

For a number of years you have been carrying $500,000 that was not authorized but was appropriated and it always slips and I am wondering where it slipped to. Is there $500,000 still available for geothermal steam somewhere in your vast bureaucracy?

Mr. ABBADESSA. No, sir.

Senator BIBLE. That has gone, but where did it go?

Mr. ABBADESSA. We have been down this road before.

Senator BIBLE. I know. We not only authorized it, we appropriated the money.

Mr. ABBADESSA. That is correct. The last 2 years the Joint Committee has authorized the half a million and the Appropriations Committees and the Congress has appropriated it.

Senator BIBLE. That is right.

Mr. ABBADESSA. The OMB has not apportioned it and we have used that money as an offset against the following year's request.

Senator BIBLE. You mean you use it to pay the increases in salaries?

Mr. ABBADESSA. No, sir. What we do is lay out to the Congress what our request is this year and then we reduce the request by the amount of what we call carryover funds from a prior year.

Senator BIBLE. We are almost up to July; you are not carrying over $500,000 for geothermal steam in fiscal year 1974?

Mr. ABBADESSA. That is correct.

Senator BIBLE. It has gone?

Mr. ABBADESSA. That is correct.

Senator PASTORE. If that could be pursued. In other words, this is not a line item. You have the discretion whether to spend it or assign it to something else?

Mr. ABBADESSA. No, sir. After appropriation, all Government agencies have to request apportionment from the OMB. We did request apportionment, specifically half a million for this purpose. The OMB denied the apportionment and when this year's budget was prepared and submitted by the President in January, that half a million was used to reduce our request for this year.

Senator PASTORE. You haven't got the import of my question.

The fact still remains this was not a line item. In other words, it was an item that could have been shuffled around any way the OMB thought fit to do it?

Mr. ABBADESSA. The Congress appropriated specifically for this purpose and I think in your terms, Senator, it is a line item.

Senator BIBLE. It was a line item.

Senator PASTORE. Is the money frozen?

Mr. ABBADESSA. Yes, it was impounded.

Senator STEVENS. As I understand it, it was used to reduce the overall request on the basis that it would be utilized for other purposes?

Mr. ABBADESSA. That is correct.

Senator BIBLE. Yes, sir, it just disappeared in that manner.

ARCHITECT AND ENGINEERING STUDY CENTER

Senator STEVENS. Let me ask you one other thing. I understand there are $350,000 for architect and engineering studies for a National Security and Resources Study Center at Los Alamos not in this bill now.

Could you tell me what happened to it?

Dr. RAY. Mr. Abbadessa?

Mr. ABBADESSA. The Joint Committee authorized that sum of money to start AE on a facility to be built at a site not yet designated. The House Committee did not appropriate the money.

Senator STEVENS. Was it requested in the budget?

Mr. ABBADESSA. No, sir; it was not requested in the President's budget.

Senator STEVENS. Did you support it before the House Committee?

Mr. ABBADESSA. I don't believe it came up at the House Committee, sir.

Senator BIBLE. I think that would be a correct answer, because it wasn't added into the AEC authorization until after the budget.

Senator PASTORE. You didn't ask for the money?

Senator BIBLE. It wasn't authorized.

Senator STEVENS. But it was included in the authorization bill.

Mr. ABBADESSA. That is correct.

Senator STEVENS. Again may I ask that a justification be placed in the record of that amount which was authorized by the Joint Committee?

Senator BIBLE. Yes, and in that connection I will furnish you a series of questions dealing with this item. It was an item that was presented very vigorously by Senator Montoya, as you know, in the Joint Committee authorization. When was that authorization? It passed the House yesterday. When did it come out of our committee?

Mr. ABBADESSA. June 14.

QUESTIONS SUBMITTED BY HON. JOHN M. MONTOYA, U.S. SENATOR FROM NEW MEXICO

Senator BIBLE. I have a series of questions from Senator Montoya, who is otherwise occupied this afternoon, that I will ask in his name concerning the National Security and Resource Studies Center, what it does, where it should be located and so forth, and whether they can put $350,000 appropriation to good use. I suppose the answer to the last question is yes.

Mr. ABBADESSA. That is true.

If this committee restores the $350,000 the Commission could put the money to good use. Conceptual planning studies have been completed. An architect-engineer can be selected as soon as funds become available. An early AE start in fiscal year 1974 will provide an additional hedge against future escalation in costs due to inflation.

Senator BIBLE. I thought that would be the answer.

But you may have other questions besides that on this Center, Senator Stevens.

Senator STEVENS. No; I was informed by Senator Domenici the Senators from New Mexico are interested in this.

Senator BIBLE. Yes; and I think the questions overlap. We will ask you to provide answers to these questions.

[The questions and answers follow:]

NATIONAL SECURITY RESOURCES STUDY CENTER, LOS ALAMOS

Senator MONTOYA. The Joint Committee on Atomic Energy authorized $350,000 for architect engineering work for the National Security and Resources Study Center at Los Alamos. Can you explain what the Center is and why it is important?

General CAMM. The National Security and Resources Study Center will provide offices and seminar rooms for use by scientific working study groups and will house the Los Alamos Scientific Laboratory (LASL) technical library. LASL has had numerous requests to host scientific working study groups such as the Defense Science Board, the JASON Committee of the Institute for Defense Analysis, and the various Service Scientific Advisory Panels. LASL has been unabe to honor such requests due to lack of space. This project will provide the required space and will allow the LASL technical library to be moved from currently inadequate space within the main administration building.

Senator MONTOYA. I am advised that, at present, there is no suitable center where conferences of scientists may take place. Is that correct?

General CAMM. It is correct that there is no suitable center for *study groups* dealing with classified subjects. There are several organizations, including the Los Alamos Scientific Laboratory, which presently have the facilities to host conferences on security matters. However, scientific work/study groups usually meet for periods of from two to six weeks and need access to library and computer facilities and technical consultants. At present, there is no location that can provide the necessary office space, library and computer facilities, and technical experts for a classified work/study group. The National Security and Resources Study Center would satisfy all these requirements and could also be used for unclassified studies and work shops. Such a study center will prove invaluable in the years ahead when national planning for energy and foodstuffs will become extremely important. We visualize the center being used by all national agencies.

Senator MONTOYA. Why cannot groups of scientists meet on a college campus, for example, or at the AEC Headquarters in Germantown?

General CAMM. College campuses are available for weeks-long work/study sessions only during the summer months, but, more importantly, the security is inadequate for classified studies. In addition, studies related to national security are not always appropriate to or welcome on college campuses. The AEC Headquarters does not have space for scientific work/study groups nor does any other existing federal center. We are considering working space for up to 50 scientists and supporting staffs. Again, this Center will be used by many federal agencies and departments. As examples, Guyford Stever of the National Science Foundation and Lt. General William Gribble of the Army have both expressed extreme interest in such a facility.

FACILITIES FOR A CENTER AT LOS ALAMOS

Senator MONTOYA. The Committee recommends in its report that the study center be located at Los Alamos. Can you tell me what facilities Los Alamos has that would make this site appropriate?

General CAMM. Aside from the office space that the National Security and Resources Study Center would supply the Los Alamos Scientific Laboratory has excellent facilities and resources to support scientific work/study groups. The Los Alamos Scientific Laboratory library system, one of the finest technical libraries in the country, includes about 200,000 books and bound journal volumes, over 480,000 classified and unclassified reports, and about 3,800 scientific and technical journal subscriptions. The Los Alamos Scientific Laboratory computing center is one of the most powerful in the world. It is built around two Control Data 7600 and three Control Data 6600 computers. Additional computers of the same or larger size plan to be added in the future. The Los Alamos Scientific Laboratory staff, which would be available to work and consult with work/study groups, includes over 1,700 scientists and engineers, primarily in the areas of physics, mathematics, chemistry, materials science, and biology. In addition, at LASL a variety of laboratories and machine shops are available, and LASL can provide excellent support in areas such as communications, graphic arts, and technical editing and publication production. The climate and surrounding area are definite assets in locating the center at Los Alamos.

EXPANSION OF ROLE OF LOS ALAMOS AS NATIONAL LABORATORY

Senator MONTOYA. One of my concerns is to diversify the work being done at our national laboratories. Do you believe construction of this facility would help Los Alamos expand its role as a national laboratory?

General CAMM. The National Security and Resources Study Center, by increasing communication and interaction between LASL and the rest of the scientific and technical community, would undoubtedly serve to stimulate and benefit LASL and AEC programs in such areas as laser research, energy development and use, biology and environmental quality, and would thereby serve to broaden the range of activities at LASL and clearly strengthen the AEC's role as a national agency working on problems of national importance. As a result of these interactions, the existence of the National Security and Resources Study Center would, of course, also benefit the basic LASL programs in national defense, energy, biomedical, and materials research.

EFFECT OF REDUCTION IN BUDGET REQUEST

Senator MONTOYA. What impact does the $15.1 million cut in testing have on the national laboratories; i.e., how would the cut be spread out?

General CAMM. There would be, as Dr. Ray has stated, a significant cut in the number of tests that could be undertaken. We have not attempted to determine which laboratory tests would be the ones to remain in the test schedule. We would, however, attempt to minimize the impact upon each of the laboratories.

COMPARISON BETWEEN LIVERMORE AND LOS ALAMOS LABORATORIES: RATIO OF FUNDING

Senator MONTOYA. My staff recently compiled figures showing the ratio between money received by Livermore Laboratory for the weapons program and money received by Los Alamos. The figures show that between 1960 and 1965, Livermore annually took a larger and larger share of the whole amount going to the two laboratories. Between 1966 and 1973, however, this trend was reversed and Los Alamos and Livermore became more equal, although Livermore still had a share approximately 38% greater than Los Alamos' share in 1973.

I view this as a favorable trend, and hope to see it continue this year. What I would like to know now is whether this trend toward equalization between Los Alamos and Livermore will continue (a) if the House figures are adopted, and (b) if the $17.7 million the House cut for weapons is restored?

General CAMM. The ratio of funding provided to the Los Alamos Scientific Laboratory and the Lawrence Livermore Laboratory is dependent upon (1) the relative priorities of the work assigned to each laboratory, and (2) the total level of funding available to support the laboratories. As noted by your staff, these factors have resulted in an increase in LASL's share of weapons program funding in recent years.

This trend will be interrupted as a result of recent changes from the Congressional budget levels. As we now see the weapons program requirements, reductions made by both the Joint Committee on Atomic Energy and the House Appropriations Committee will have a greater percentage impact upon LASL funding than upon LLL funding although the actual dollar reduction at Livermore is greater than at LASL.

The $17.7 million House cut will primarily affect the Nevada Test Site which provides support to both laboratories.

WEAPONS PRODUCTION PROGRAM

Senator MONTOYA. Can you provide further details on reductions in the weapons production program as a result of the JCAE action?

General CAMM. The production and surveillance reduction of $37.8 million requires termination of all work on the W74 and W75 AFAP, a delay of initial delivery of B61 bomb from FY 1974 to FY 1976 [deleted] and significantly reduced production rates in FY 1974 and FY 1975 on the W62 MINUTEMAN III, W69 SRAM, and W70 LANCE warheads. The latter three shortfalls will have significant cost and capability impacts on DOD missile deployment programs.

Senator MONTOYA. Have you consulted with the DOD on the reductions in weapons production? Have they described the impact of these reductions?

General CAMM. Yes. The Department of Defense is currently reviewing the impact of the delays in deliveries of the B61, the W62 MINUTEMAN III, and W69 SRAM, and the W70 LANCE. Their review is not yet completed [deleted].

TESTING PROGRAM

Senator STEVENS. On the weapons program, $17.7 million, as I understand it, $15.1 million is for the testing program. Now, what is the other portion of that for?

Dr. RAY. Isn't that the $17.7 million that we are asking to have restored?

Senator STEVENS. Yes. Of that the House report says $15.1 million is for the testing program.

Dr. RAY. No direction or guidance was given on how the rest of that reduction should be applied. In the authorization bill, the joint committee, which also indicated reduction in the weapons programs, directed that the impact on the national laboratories, the weapons laboratories, should be minimal.

Senator STEVENS. Have you made up your mind where that would be applied if that $2.6 million cut beyond the testing program cut is maintained by the Senate. Where would that $2.6 million come from, that is what I don't understand from this report as I read it.

Dr. RAY. We are appealing for that to be restored.

Senator STEVENS. I understand that.

But I don't know what it is going to be restored to.

Senator PASTORE. We are talking about an item that is in the neighborhood of $850 million and that is where this cut was made. And what they are saying is, that apart from the testing, what is left over, residual, will go back in the general pot.

Senator STEVENS. I see.

Senator PASTORE. This money is for the overall weapons program, supports two laboratories and what else have you?

Dr. RAY. A great deal of production.

Senator PASTORE. That is right.

And the big problem before our committee was the fact we didn't want to do anything to injure the laboratories research program and that is the reason why they have only taken small amounts of this out of research.

Dr. RAY. It is not only because of the importance of those laboratories to the weapons program. They also conduct a great deal of very important basic research.

Senator PASTORE. Yes.

CIVILIAN REACTOR DEVELOPMENT PROGRAM INCREASES

Senator STEVENS. Then my one last question would relate to the increases. As I look at this, there are three basic increases in the civilian reactor development program, four in civilian.

Did you request those from the House committee; are these increases related to the authorization bill; where did they come from?

Dr. RAY. Could you identify the increases?

Senator STEVENS. One is a million dollars for the high temperature gas reactor.

Dr. RAY. That was in the authorization act. It was authorized by the joint committee.

Senator STEVENS. And the budget request was less than the authorization; is that correct?

Dr. RAY. Yes.

Senator STEVENS. Then the thorium utilization program; is that the same?

Dr. RAY. Yes, sir. Our request was $2 million, the joint committee authorized an additional $2 million. The House action was an additional $1 million.

Senator STEVENS. I see.

Senator PASTORE. You had $3 million?

Dr. RAY. That is right.

Senator BIBLE. You have a total program of 3?

Dr. RAY. $3 million.

Senator BIBLE. Somebody in the back is shaking his head the other way. Could he clarify the answer? Is $3 million the right answer?

Mr. ABBADESSA. $3 million is the right answer.

Senator PASTORE. How about high temperature gas reactors?

Dr. RAY. The AEC's request was $5 million; the joint committee authorizing action increased that by $2 million. The House action increased by $1 million.

Senator PASTORE. So you have $6 million?

Dr. RAY. That is right.

Senator BIBLE. Further questions?

Senator STEVENS. What about the $600,000 for the solar energy research, is that the amount that was authorized by the authorization bill?

Dr. RAY. Yes, sir.

Senator BIBLE. Total amount authorized, that is right up to full authorization?

Mr. ABBADESSA. Yes, sir.

Senator STEVENS. I am interested to see if there are any areas where Congress, authorized funds particularly in these civilian reactor programs or in this applied energy technology program where you are not funded right up to the level of the authorization bill.

Dr. RAY. The outstanding one there, sir, is in the geothermal program. If you would like a breakdown of how we would appropriate those, that $4.7 million, I have the figures here.

Senator BIBLE. I wish you would furnish that for the record. Supply it to the subcommittee.

Senator STEVENS. Yes.

ISOTOPES PROGRAM

Dr. RAY. The isotopes program, which we have just been through, is another one.

Senator HATFIELD. $1.7 million?

Dr. RAY. Yes, sir.

Senator HATFIELD. I wonder if they would supply that for the record.

Dr. RAY. Yes, sir.

[The information follows:]

In FY 1974 the proposed $4.7 million geothermal program would provide $3.0 million for dry hot rock research and development, $1.4 million for hydrothermal systems development, and $0.3 million for geothermal cost effectiveness analysis.

An additional $1.7 million for isotopes would essentially allow AEC to maintain the FY 1973 level of effort.

MOLTEN SALT PROGRAM

Senator HATFIELD. $1.7 million additional?

Dr. RAY. Yes, sir. The other one we might mention is the molten salt program, one of the alternative concepts to the liquid metal breeder. This program has been moving along rather slowly and the Commission this year did not request any funds. The joint committee, however, authorized $2 million that was not appropriated.

Senator PASTORE. The House committee knocked that out?

Dr. RAY. Yes, sir.

Senator STEVENS. I want to commend Dr. Ray for the speech on the coal industry, pouring the coal on here. I really think it is very good, Dr. Ray, the broad grasp of the energy picture you have and maybe one of these days you would give us a briefing on where we are going on this.

Senator BIBLE. Alaska pipeline?

Senator STEVENS. No; we don't want to send those warheads through the pipeline, Mr. Chairman. [Laughter]

Dr. RAY. We would be more than pleased to do so.

Senator BIBLE. Senator Bellmon?

Senator BELLMON. Dr. Ray, is there some thought that the AEC ought not be in the geothermal research area, that perhaps Interior ought to be handling that; is this one reason that the funds were not approved by OMB?

Dr. RAY. Senator, I don't think I can answer your question with respect to the reasoning in OMB but I can say this, that the people in our laboratories are imaginative, they are full of ideas, and it is awfully hard to tell people not to think. We have had some very fine proposals come out of our national laboratories. In fact, some of them have won support from other sources when we were not able to provide it through the Commission. We have developed the feasibility of some of the concepts to the point that, if funds were provided, the Atomic Energy Commission would be ready to move out with some demonstration programs which I think would be extraordinarily interesting.

Mr. ABBADESSA. There is an important point that should be brought out. At the time that the President's budget came forward a decision really had not been made on who would be the lead agency in this nonnuclear R. & D. The President included a contingency fund of $25 million in the Interior budget and we were advised in our allowance letters that AEC laboratories will be eligible for funding for nonnuclear energy research from a new appropriation being established in the Department of the Interior.

I think today the thinking has crystallized and I think the administration will be sponsoring legislation which will better identify our role in this area.

Senator BELLMON. My question is if we provide funding through Interior and then turn around and provide funding through AEC for the same purpose, we are going to have duplication, overlap, and conflict between the two agencies. It seems to me one of them ought to have this responsibility and not both.

Senator HATFIELD. I would like to just add to his question one addendum.

I think I indicate the phrase that really answers part of the question for me. You were talking about demonstration unit. Is this not

a type of research that calls for, you might say, almost a proliferation of demonstration units rather than a centralized laboratory research project? Is this true so, therefore, there could easily be complementary activity going on as between more than one agency?

GEOTHERMAL CONCEPTS CONSIDERED

Dr. RAY. Yes, we have several different concepts in the geothermal area that are being considered. A hot dry rock concept involves one kind of technology.

There is a geothermal steam concept which has already been developed to a certain extent in the geyser field and there are other possibilities for it.

There are other possibilities of tapping into places where there are nonexisting geysers. One very interesting concept which came out of the Lawrence Berkeley lab has to do with hot brines.

Senator HATFIELD. You are going to be out on the ground more than in a central lab.

Dr. RAY. Yes.

Of course, there is a lot of laboratory work to do, you have to work back and forth.

Senator PASTORE. It is also interesting to know how far back this study goes. We have been listening for a long time.

Dr. RAY. The concepts have been quite a while developing. Mr. Flaherty might know when the laboratories began thinking along those lines.

Mr. FLAHERTY. Well, I think the hot dry rock project, which is the one that we have spent perhaps our major effort on, began developing at Los Alamos laboratories about 3 years ago. They have located an area that happens to be physically quite near the laboratory in New Mexico and is particularly favorable for conducting the experiment. We have, with our general research funds, drilled several test holes to confirm the temperature profile in the rock. We are right now in a position to usefully expend $3 million on the program in fiscal year 1974. That would enable us to drill this test hole down to a depth of about 7,500 feet where we expect to encounter temperatures that are sufficient to produce useful energy and to produce the demonstration that we discussed.

Senator BIBLE. Senator Bellmon?

Senator BELLMON. Mr. Chairman, I am not sure I need to go further with this but it seems to me the committee ought to coordinate its decisions with the administration and be sure that we are only funding the agencies that will be authorized to carry on this work.

Senator BIBLE. I think that might be a good point, but I think the point just made is equally valid, and that is AEC has been doing great work in this at Los Alamos, so I think there is another role in this for AEC just as well as for Interior. I don't think it is an overlap.

INTERIOR CONTRACT WITH AEC

Senator BELLMON. From what was said earlier by one of the witnesses, it sounds to me as if the administration plan was to put $25 million in the Interior appropriation and then Interior would contract with AEC for the actual performance of the work.

Dr. RAY. I think that was, as Mr. Abbadessa said, an idea that was expressed at the time the budgets were being drawn. There has been a considerable amount of discussion since that time as to how the administration recommendation would be formulated with respect to lead agencies and responsibilities with respect to particularly AEC and Interior. It is my understanding that the President is expected to announce in the very near future the definitive roles he anticipates as part of the reorganization plan.

Senator BIBLE. There is a $25 million item in the Interior appropriation bill, I know, because I handled the Interior appropriation bill, subject only to the discretion of the Secretary of Interior. I also know that when that bill passes the House tomorrow or the next day, it will be earmarked, that $25 million will be earmarked for certain projects. When it comes over to our side and Interior Committee takes a look at it, I think we might earmark a little of that for geothermal steam. Name the project rather than leaving the discretion to the Secretary of Interior. I think that is the way it will evolve, and we will know better at the end of this week.

Senator BELLMON. It seems to me our Government must soon make some decision the way we are going to attack the total energy problem, because we presently have five, six, seven, maybe a dozen agencies dabbling in the energy area and no one seems to be coming to grips with it, and I am not sure this is the time and place to make the decision; we are going to need an agency in energy that will coordinate the total efforts of Government.

PROPOSED DEPARTMENT OF ENERGY AND NATURAL RESOURCES

Senator BIBLE. I couldn't agree more, and I have seen one of the many plans that has been evolved for creating a new Department of Energy and Natural Resources. The President is supposed to speak out on it.

Senator HATFIELD. Tomorrow.

Senator BIBLE. Tomorrow is the day he is going to speak out. As soon as we get that message, then we will be able to evaluate it, because it is an attempt to pull all of these loose strings together and make some headway for a greater assault on this energy problem.

Senator HATFIELD. I would like to observe, in order to make the record complete at this point, that the chairman of our subcommittee, Mr. Bible, and I have worked together on the Interior Subcommittee of the Appropriation Committee, and for over a year the Interior Department has promised us some rules and regulations on the leasing of KGA's that have already been identified by the Interior Department.

For some reason, the bureaucracy cannot come up with a simple set of regulations governing leasing of land, what we call KGA; and if anything, I would like to see AEC take a stab at this because I have certainly been disappointed by the failure of the Interior Department to come to grips with this.

Each time we have asked them the question, as the chairman well knows, because he has propounded the question to the agency time after time, they say give us another 3 months. Three months comes and goes, and they want another 3 months; and that comes and goes, and I have frankly not been impressed with what the Interior Depart-

ment has done thus far on moving where we actually know where the geopotential economists for private leasing go and develop.

Senator BIBLE. I think it is a valid observation, one in which I concur. If we add the $4.7 million, you will be permitted to spend it? Is that fair question?

Dr. RAY. We will certainly try hard. If we are permitted to spend it, we will.

Senator BIBLE. I am sure you could. That wasn't the question.

Mr. ABBADESSA. The only real assurance we can give you is this agency will request it.

Senator BIBLE. I think you can go further than that. We are trying to find somebody enthusiastic about the geothermal steam, and Senator Hatfield and I have had difficulty finding anybody.

Senator PASTORE. Could you use it wisely?

Dr. RAY. We believe so. Mr. Flaherty already mentioned we have good estimates for spending $3 million on the hot rock. In addition to this, the hydrothermal steam, particularly the brine—Lawrence Berkeley and Livermore Laboratories have been working on this, and we intend that $1.4 million be spent on this concept. Also, we have the Pacific Northwest Laboratory well informed and anxious to start work on some cost-effectiveness studies which are important to go along with the technical work. We would allocate about $300,000 to that particular function.

Senator BIBLE. Thank you, Doctor.

Let me return just to another couple of items here.

WEAPONS PROGRAM FUND REDUCTION

Now, the House committee report says, "The committee has reduced the weapons program $17.7 million—of this reduction, $15.1 million is for the 'testing' program. In addition, funds for the proposed restart program are limited to new improved features related to weapons protection."

Now, you are in a position to comply with that mandate?

Dr. RAY. Yes, sir.

Senator BIBLE. "No funds are included for the production or testing of the artillery fired atomic projectiles" and there is no money in here for that?

Dr. RAY. Yes, sir.

Senator BIBLE. That took away two projects, as I understand it.

Are you appealing the reduction that was made for the 61 bomb? You are not?

Dr. RAY. No.

Senator BIBLE. Now, will you furnish for the record, and maybe you have it available now, what the total impact is on the weapon program of the $15.1 million cutback in testing?

I have interest in that because much of the testing has been carried on in the Nevada test site.

Dr. RAY. Yes, sir.

Senator BIBLE. How many people does that affect? Does it lay off 200, 300, 400? I would like the figure for both the House committee figure and for the restoration of $17.7 million.

General CAMM. I believe I can give it to you.

FUND REDUCTION IMPACT ON PERSONNEL

Senator BIBLE. How many people do you have aboard as a result of the House action?

General CAMM. In fiscal 1973, we had 4,737 people.

Senator BIBLE. In the testing program?

General CAMM. In the testing program.

Senator BIBLE. They were located where?

General CAMM. In Nevada.

Senator BIBLE. Totally in Nevada?

General CAMM. About 95 percent were in Nevada. In fiscal year 1974, getting down to our requested budget, we were taking a cut of 582, getting down to 4,155 in the testing program. Then as a result of the $11.1 million cut that we took in testing as a result of reduction from the Joint Committee action, we took 230 more people away, and then if we take an additional——

Senator BIBLE. The House committee cut an additional $15.1 million?

General CAMM. If that were construed to be an additional reduction on top of the $11 million we have taken, we would take away another 300 to 500 employees, for a total reduction of close to 1,200 people from the fiscal year 1973 level.

Senator BIBLE. So if this is restored, you put back another 300–500; is that what you are saying?

General CAMM. Well, we wouldn't have to take that much additional cut.

Senator BIBLE. You will keep them there?

General CAMM. That is right, they won't be laid off.

Senator BIBLE. Those are the figures that I wanted. And I have no other questions.

Senator PASTORE. I think along that line we ought to emphasize the fact the question was brought up by Brezhnev's visit, there was an exclusion, specific exclusion as to qualitative improvements, was there not, in their talks, both sides agreed to improve qualitatively.

Am I right in that?

[Deleted.]

Senator PASTORE. The word "temporary" was used, wasn't it?

Mr. GILLER. I don't recall the word "temporary." What will actually come out in terms of a specific agreement on systems, we are, I think, a year or two away from actually seeing results, because of the extraordinary difficulty of getting the Russians, for example, to agree 10 apples are equal to 10 oranges. The two leaders have agreed the negotiators over there in Geneva must try to do this, and it is very difficult negotiations.

Senator PASTORE. I have a strong feeling on the artillery shell, of course, and the people can disagree with me, but I am a strong believer in testing until we get bilateral agreement, and I think it would be foolish because our advantage, and this was even in SALT I, our advantage is qualitative rather than quantitative, and I don't think we ought to sacrifice that at all, and I think this is the wrong place to make the cut really in testing at this moment.

Mr. GILLER. $11 million, which was taken out of the weapons test program, as a result of the joint committee action represents a balance between tests and production. If we were to take that $11 million also from our weapons production program, we would have additional

SRAM missiles, Lance missiles and Minuteman missiles sitting around without any warheads. The present reduction will result in a certain percentage of them having to wait for warheads. Another $11 million would only exacerbate that problem. It is a weighing of today's strategic forces against R. & D. for the future and it is a judgment on our part.

OPERATING EXPENSES AND CAPITAL EQUIPMENT

Senator BIBLE. Thank you very much.

How would the additional $8.5 million for operating expenses and $1 million for capital equipment authorized by the Joint Committee on Atomic Energy be utilized within the CTR program?

Dr. HIRSCH. The $8.5 million increase in operating would provide for:

	Millions
1. ORMAK high field modification	$1.2
Replacement of the ORMAK toroidal field coils will increase the magnetic field from 25 to 50 kilogauss thereby lengthening plasma confinement in ORMAK by more than a factor of five.	
2. Superconducting magnet development program for toroidal systems	1.0
This provides for the fabrication of prototype magnets to obtain information necessary for the design of future generation superconducting tokamaks.	
3. Scale-up of the inductive energy storage program	1.2
This would provide support for R. & D. directed toward new energy sources which will be required for the next generation of theta pinch experiments. It will also have applications in powering large laser modules as well as toroidal currents in tokamak experiments.	
4. Three dimensional computer simulation	1.5
There is an increasingly urgent need to scale-up present computer usage in CTR and to develop the capability to simulate the behavior of large scale thermonuclear plasma systems and fusion reactors. Adequately supported over the next 3–5 years, CTR physicists may be able to simulate actual experiments on computers.	
5. Fusion technology	2.2
The main activities to be undertaken include selected materials studies which are important and relevant to both the near term and long term program goals. Another important activity involves design studies and follow-on work related to providing a material and engineering test environment characteristic of a fusion power reactor. Such a facility is critically important for integrated CTR engineering studies.	
6. Configuration test torus (CTT)	0.8
This would provide for the design and possible initial fabrication of an experiment aimed at the study of noncircular tokamak systems (which appear able to more efficiently use magnetic fields) and divertors (plasma cleaners).	
7. University research	0.6
These funds would be utilized to expand and strengthen a variety of fundamental plasma physics studies at universities throughout the country including some work on computer simulation.	
Total operating costs	8.5

Dr. HIRSCH. The additional $1 million in capital equipment will be used for a power crowbar for the 2XII mirror experiment. A power crowbar will extend the magnetic field for longer periods than the existing system can provide.

Senator BIBLE. What is the basis for the optimism that would warrant appropriation of additional $8.5 million in fiscal year 1973?

PLASMA CONFINEMENT EXPERIMENTS

Dr. HIRSCH. Recently, major progress was made in two plasma confinement experiments of the tokamak type. These were the adiabatic toroidal compressor (ATC) at Princeton and the ORMAK at Oak Ridge. For the first time in tokamaks, the ATC reached the plasma density regime in which a tokamak fusion reactor would have to operate, and the experiment established a new technique for heating tokamak plasmas to thermonuclear temperatures. In addition, ATC successfully tested some of the new technology that is necessary for future experiments. These results occurred late in calendar 1972.

In the spring of this year, after the Presidential budget was prepared, another major success occurred. The ORMAK demonstrated successfully that the good plasma confinement typical of smaller tokamaks could be scaled-up to devices of larger size and smaller aspect ratio—necessary conditions for future fusion reactors. The ORMAK experiment advanced further than any other tokamak toward the so-called collisionless regime in which fusion reactors must operate, and study of its detailed behavior demonstrated very good correlation with theory. Finally, it showed that good plasma stability can indeed be maintained in larger systems.

The results from both of these experiments are of major import and in many respects exceeded what had been conservatively expected. Very important experiments on heating tokamak plasmas to thermonuclear temperatures can now be performed in fiscal year 1974. The most important of these is in the area of neutral beam injection techniques for heating to thermonuclear temperatures. This method has just been tested at low input power in the ATC experiment at Princeton. The result is a 20-percent increase in ion energy, as expected from preoperational theory. Experiments at higher power will be conducted on the ORMAK experiment at Oak Ridge this summer.

Another new heating technique will be explored this year in the staged theta pinch experiment at LASL. We also will continue fabrication of the PLT Princeton and modification of the 2X–II device at LLL. Successful experimental results along the aforementioned lines would lead directly into new programs of experimentation aimed at demonstrating scientific feasibility.

Any further questions?

Senator PASTORE. May I ask a question or two. I won't take much time.

LIQUID METAL FAST BREEDER REACTOR

On this question of the second demonstration of LMFBR, you make no comment on that.

Dr. RAY. No, we did not.

Senator PASTORE. You made no request, you put it in the authorization.

Dr. RAY. Yes, sir.

Senator PASTORE. We put it in $2 million and the House committee knocked it out completely.

Mr. ABBADESSA. No, sir. We still have authority to this point. They have words in the report which indicates that $1 million which might be available from other sources can be applied to the second plant.

Senator PASTORE. You intend to do that?

Dr. RAY. The intention, as I understand it, would be to continue with some project definition work.

Senator PASTORE. How about the molton salt reactor?

Dr. RAY. If the funds are provided, they have been again——

Senator PASTORE. You didn't request any for that.

Dr. RAY. We have not requested any in the budget.

Senator PASTORE. But we authorized it up to $2 million.

Dr. RAY. Yes, sir.

Senator PASTORE. The House granted nothing?

Dr. RAY. That is correct.

Senator PASTORE. If we grant it could you use it?

Dr. RAY. Yes, sir.

Senator PASTORE. To advantage?

Dr. RAY. I believe so. The program, as you know, is in the process of tapering off, but it could be kept alive and the important technical people who are still working could be kept on.

PLOWSHARE

Senator PASTORE. I see my old friend Dr. Brown is here. How are we doing on plowshare?

Dr. JOHNSON. Plowshare is grinding along, Senator.

Senator PASTORE. Is it Brown or Johnson?

Dr. JOHNSON. Johnson. But that was a standard confusion a number of years ago.

Senator PASTORE. That is right. I was thinking about a fellow at the University of Rhode Island.

Dr. JOHNSON. In plowshare, we have just conducted a gas-stimulation experiment—Rio Blanco. It will be several months before it is assessed in terms of gas production, but operationally it went very well.

QUESTIONS SUBMITTED BY HON. JOSEPH M. MONTOYA, U.S. SENATOR FROM NEW MEXICO

Senator BIBLE. Senator Montoya has some additional questions on the geothermal matter, and you can supply the answers for the record.

SHORT RECESS

Further questions?

Thank you very much for very able presentation, Doctor, and we will labor on this and do the best we can.

We will take a brief recess before we proceed with the Corps of Engineers.

[The questions and answers follow:]

GEOTHERMAL DEVELOPMENT RESEARCH

Senator MONTOYA. It is my understanding that the AEC initially requested $4.7 million for research in geothermal as a source of energy, but that this sum was cut out of the budget requests by OMB. Is that correct?

Dr. JOHNSON. Yes. the original AEC request for research in geothermal development was for $4.7 million. The OMB did not support this in the President's fiscal year 1974 budget. Subsequent to that time, increased interest by both Government and industry has emerged.

Effect of Restoration of Budget Reduction

Senator Montoya. If this committee restores the $4.7 million, to what use would the AEC put it?

Dr. Johnson. Basically, we feel that the AEC and its laboratories can bring energy development experience and a strong scientific base to bear on the numerous technical problems slowing the development of geothermal energy. The proposed fiscal year 1974 AEC geothermal program to develop energy recovery technology involves research and development programs centered at four AEC laboratories. The R. & D. activities would be directed toward economical energy production through exploitation of two types of geologic phenomena—dry hot rock formations and natural underground hot water or brine reservoirs. The basic problem to be addressed in both cases is the development and demonstration of technology for the practical and economic extraction of useful quantities of heat from these natural thermal sources for power production. A complementary effort would be pursued to define the cost effectiveness of the various approaches being studied for heat extraction, conversion, and utilization. Successful development of this technology would significantly increase our sources of power and do so with little or no adverse environmental impact.

In fiscal year 1974, the proposed geothermal program would provide $3 million for dry hot rock research and development at Los Alamos Scientific Laboratory, $1.4 million for hydrothermal systems development at Lawrence Berkeley Laboratory and Lawrence Livermore Laboratory, and $0.3 million for geothermal cost effectiveness analysis at Pacific Northwest Laboratory.

Senator Montoya. Would any of the money be used on the so-called hot rock process?

Dr. Johnson. As I noted earlier, LASL would be the lead laboratory in developing the dry hot rock process which would be a $3 million effort in fiscal year 1974. Let me elaborate on the dry hot rock process.

In many areas of the U.S. granitic intrusions significantly above normal temperatures are known to exist at relatively shallow depths. That such geothermal deposits contain enormous amounts of energy can be shown by a numerical example. If a cubic mile of granite, originally at 300°C, is cooled to 100°C, approximately 1.5×10^{15} BTU's can be recovered. This value equals about one week's energy requirements for all purposes for the entire United States.

The economic recovery of this potential geothermal resource will require the development of a new technology. The AEC's Los Alamos Scientific Laboratory has developed a concept which may be the key to the utilization of dry hot rock. It consists of drilling into an intrusion, fracturing the rock hydraulically (with the expectation of creating a vertical, lens-shaped fracture with a radius of some 1,500 feet), drilling a second hole and establishing a convective circulation pattern for coolant water under pressure. If the original fracture zone can be enlarged by thermal stress cracking and the newly exposed hot rock is adequately cooled by convective flow, the original dry hot rock can be mined of its heat content.

Geothermal Development and the Energy Program

Senator Montoya. How does development of geothermal fit into our total energy picture?

Dr. Johnson. We are quite optimistic about the ultimate contribution geothermal energy can make to the Nation's power and heat requirements. Since, in part, technological developments will determine the rate of growth of this energy source, the percentage of total energy requirements it will supply at a given future date is difficult to predict. We have made some estimates based on expected technological accomplishments which suggest that 30,000 MWe is attainable from geothermal sources by 1985. We believe that the nature and magnitude of energy development resources are such that within the next 10–15 years it could begin to contribute significantly to the solution of our Nation's urgent energy problems. In the President's 1973 energy message a geothermal generating capability of only 4,000 MWe was predicted by 1985. However, the message notes that technological breakthroughs might increase this total. It is the AEC's contention that technological breakthroughs would allow geothermal energy to play a significant role during the 1980's.

DEPARTMENT OF THE ARMY

Corps of Engineers

STATEMENT OF MAJ. GEN. J. W. MORRIS, DIRECTOR OF CIVIL WORKS

ACCOMPANIED BY:

COL. FREDERICK F. IRVING, ASSISTANT DIRECTOR OF CIVIL WORKS FOR ATLANTIC DIVISIONS

COL. RAYMOND J. EINEIGL, ASSISTANT DIRECTOR OF CIVIL WORKS FOR CENTRAL DIVISIONS

COL. JAMES M. MILLER, ASSISTANT DIRECTOR OF CIVIL WORKS FOR PLAINS DIVISIONS

LT. COL. PAUL C. DRISCOLL, ASSISTANT DIRECTOR OF CIVIL WORKS FOR PACIFIC DIVISIONS

LT. COL. C. E. EDGAR III, ASSISTANT DIRECTOR OF CIVIL WORKS FOR MISSISSIPPI VALLEY

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DANIEL J. SHANAHAN, CHIEF, CENTRAL BRANCH, PROGRAMS DIVISION, CIVIL WORKS

RECALL TESTIMONY

Senator Bible. The hearing will come to order. We will now turn to the Corps of Engineers.

We are happy to see you again, General Morris. We have had the hearings with the public witnesses and we have gone through a large number of projects discussed at those hearings. Generally, questions have been submitted to you as we have gone along, and we have had testimony as to your responses. All the information will be placed in the committee markup sheets, and the questions and answers will be submitted for the record. Of course, the purpose of this special hearing is to see if members of the subcommittee have any additional questions for you, and to see if you have any additional statement or comments you would like to make. So we will turn it over to you, General Morris.

HOUSE ACTION ON APPROPRIATION BILL

General Morris. Thank you, Mr. Chairman.

We received the House of Representatives bill and report yesterday, but have not had a chance to go over it in detail. We will provide a detailed analysis at an early date, and scanning through it quickly there are a number of items that I would like to mention. They attracted my attention and are of some concern.

One was the reduction in the research and development of about $1.2 million, and another was the reduction in the dredging disposal study by $1,200,000, and a third is the large reduction in our operation and maintenance request.

We note also that there is a total increase of $26.7 million, and we will be interested in whether it will be distributed in view of the overall ceiling on the total Federal budget this year.

I believe that concludes any opening comments I had. I merely wanted to address the fact that we had received the committee report of the House of Representatives, but we have not had a chance to study it in detail at this time.

I would welcome your questions.

Senator BIBLE. These are questions that have come up which obviously I am not going to read to you. You can see the depth of this document. And I don't know how many pages it has in it, probably as many as the opening statement yesterday in front of the Select Committee on Presidential Campaign Activities hearing, which was 245 pages, I believe, and I believe this is longer than that.

But we are simply going to submit this and it will be made part of the record. I am not going to trespass on the committee's time for a minute; have all the answers been furnished?

General MORRIS. You have the answers.

Senator BIBLE. We have all of the questions and answers?

General MORRIS. Yes, sir.

MONTGOMERY TO GADSDEN—COOSA RIVER CHANNEL, ALA.

Senator BIBLE. There is nothing in the budget, the House committee has recommended that you use available funds to conduct an updated study of economics and long range costs, and local interests have requested $100,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $100,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Montgomery to Gadsden - Coosa River Channel, Alabama

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$ 228,000,000
Estimated Federal Cost (U. S. Coast Guard)		93,000
Estimated non-Federal Cost		15,640,000
Cash Contribution	$ 0	
Other Costs	15,640,000	
Total Estimated Project Cost		243,733,000
Allocations to date		0
Balance to Complete (Corps of Engineers)		228,000,000
Amount that could be used in FY 1974		100,000

Authorization: 1945 River and Harbor Act

Location and Description: The project is located in Elmore, Chilton, Coosa, Shelby, Talladega, St. Clair, Calhoun, and Etowah Counties, Alabama, between Montgomery, Alabama, and Gadsden, Alabama. The proposed improvements consist of five locks with chamber dimensions of 84 x 600 feet to be constructed in existing Alabama Power Company developments, which will provide a navigation channel 9 feet deep and 150 feet wide from Montgomery to Gadsden.

Proposed Operations: The amount of $100,000 could be used to initiate preconstruction planning. The General Design memorandum will cover all five locks which will require considerable foundation exploration.

Justification: The Alabama-Coosa Basin is rich in natural resources. Its economy heretofore has been largely agricultural. However, the basin is rapidly becoming highly industrialized. Provision of a 9-foot navigation channel would stimulate industrial expansion in the area, which would materially aid the economy of the area. The project would provide an additional means of transporting heavy and bulk commodities to and from the tributary area along the Coosa River. The Coosa navigation project will be an asset to the over-all national transportation system by providing a connecting transportation link from the Appalachia region of North Alabama and Georgia with the world and continental ports through the Port of Mobile and to the industrial and agricultural centers of the South and Midwest.

Nineteen counties in Alabama and one county in Georgia have been designated redevelopment areas under the Public Works and Economic Development Act of 1965. The benefit-to-cost ratio is 1.2 to 1. The average annual benefits are broken down as follows:

Navigation	$ 12,508,000	1/
Recreation	417,000	1/
Area redevelopment	1,405,000	1/
Total annual benefits	$ 14,330,000	

1/ Benefits are based on those contained in the report for "Development of Water Resources in Appalachia" updated to current price levels.

TENNESSEE-TOMBIGBEE WATERWAY, ALA. AND MISS.

CAPABILITY

Senator BIBLE. The budget request was $14,500,000. The House committee has allowed $18 million and local interests have requested $18 million. What is your capability on this project?

General MORRIS. Our capability on this project is $18 million, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $3,500,000?

General MORRIS. The additional amount would be used to advance completion of the Gainesville Lock and Dam by 1 year and to initiate work on the divide cut end of the project. There would be no advance in total project completion.

OPPOSITION

Senator BIBLE. We have heard testimony in opposition to this project from a representative of the Committee for Leaving the Environment of America Natural and from the Environmental Policy Center this year as we did last. A copy has been provided to you. Would you comment on some of the allegations made?

Colonel IRVING. Yes, sir. The allegations fall generally into four categories and I would like to comment on each in turn.

First, as regards flood control benefits:

The Corps of Engineers has never claimed flood control benefits for the Tennessee-Tombigbee Waterway. Flood control is not a project purpose. If developments along the waterway require flood protection, they will be dealt with on an individual basis in accordance with present policy. In any case, flood heights would not be greater with the project.

Second, as regards power:

No power installations have been included in the project due to the low heads at the dams. The benefits are based on purposes other than power and this has been properly brought out at public hearings.

Third, as regards environmental concerns:

The reference to the "Loss of the largest remaining unimpounded, unchannelized river in the Mobile Basin" is misleading. The Tombigbee River from its confluence with the Alabama River to its headwaters at the junction of Mackey Creek and Big Brown Creek is 441.72 miles in length. Since 1915, the first 220 miles, or about one-half of its total length, has been impounded and channelized and has been a portion of the existing Black Warrior-Tombigbee navigation project. The last 62.54 miles are known as the East Fork of the Tombigbee and on this portion the upper 53 miles were channelized in 1940, over 30 years ago. Therefore, only about 160 miles of the river are not channelized or impounded.

CHANNELIZATION AND INUNDATION OF TRIBUTARIES

A reference is made to the channelization and inundation of 190 miles of the tributaries. Again, this is misleading since a less than 10-mile portion of the east fork of the Tombigbee (already channelized since 30 years ago) is the only area where any tributary stream

will be affected by channelization. It is acknowledged that the tributaries will be impounded in those reaches near the waterway and that some 180 miles will be involved.

We cannot disagree with the statement that the area is rich in plant and animal life, but we do contend that the waterway will not disrupt the ecosystem to the point of disaster. On the contrary, we believe that the management of the area will protect the total ecosystem from further damage.

Opponents have made reference to "fresh water mussels, six of which are included in the Department of the Interior's listing of rare and endangered species." Up to the present time no mollusks (or naiads) are listed by the Department of the Interior. The opposition apparently is making reference to a symposium on "Rare and Endangered Mollusks (Naiads) of the United States" held at Ohio State University on April 6, 1971, which, according to the proceedings of the symposium, was the first meeting of its kind to be called for the purpose of giving attention to rare and endangered invertebrates. To date no official position has been taken by the Department of the Interior.

The discussion by opponents regarding drastic alteration of the ecosystem due to transfer of fauna and flora from the Tennessee to the Tombigbee system and vice versa is conjectural. The example indicates that the transfer of the shortnose gar and the Ohio lamprey could affect fish in the Mobile Basin but ignores the fact that neither has affected the fishery of the Tennessee River.

ALTERED SALINITY PATTERN

The statement that increased flow from the Tennessee River could significantly alter the salinity pattern of the Mobile Estuary is not correct. The increased flow into the Tombigbee from the Tennessee will increase the average annual daily flow of 60,800 d.s.f. into the Mobile Bay Estuary by about 1 percent initially and 2 percent ultimately (592 d.s.f. and 1,138 d.s.f., respectively). During floods in the Mobile River system basin when discharges, and consequently the silt load, are much higher than the average annual discharge of 60,800 d.s.f., the percentage of flow diverted from the Tennessee would be significantly less. Adverse effect on salinities in Mobile Bay under any conditions would therefore not be measurable.

The concern as to the environmental effects of strip mining are shared by the Corps, the Department of the Interior, and other agencies of the Federal Government as well as by the various States in which those operations take place. While increased mining may very well take place in order to provide the fuels for generating plants, the various States and the Federal Government have initiated action to protect those areas from devastation and to return them to a productive, attractive, usable state after depletion. It would appear that the demand for energy would encourage additional strip mining rather than would the completion of the waterway.

The statement that final disposition of spoil from the divide cut has not been determined is true. However, as part of our environmental engineering the "spoil" material is treated as a resource not a waste problem. Comparative studies being made for the beneficial use of this material include: Rehabilitation of blighted areas, such as

abandoned gravel pits and eroded gullies; creation of islands or low-profile hills along the waterway for esthetics and recreation; filling and site preparation for industrial and commercial areas; fill for roads and highways; deposition in Bay Springs Lake to create islands and possible deposition in Pickwick Lake to cover mercury-laden sediments. The final solution will probably incorporate several of these and other ideas.

ECONOMIC CONCERNS

The fourth category of concern is economics:

The Tennessee-Tombigbee Waterway will join the north-flowing Tennessee River and the south-flowing Tombigbee River to create an entirely new transportation artery connecting much of the interior of the United States with the gulf coast. Besides bringing the advantages of water transportation to the area it traverses, the new waterway will provide additional means for interchanging commerce between the Gulf Intercoastal Waterway, which connects all ports and waterways along the gulf coast, and the vast inland waterway network made up of the Upper Mississippi, Illinois, Missouri, Ohio, Cumberland, and Tennessee Rivers. The Gulf Intracoastal Waterway is complete from Brownsville, Tex., to Apalachee Bay, Fla. While there is no protected route east from Apalachee Bay, traffic does move on the open gulf portions. This movement is by means of river-gulf barges, which are suitable for both inland and open gulf use. The lowering of production and marketing costs of everyday products afforded by cheaper transportation would benefit a major segment of the population. The savings to commerce using the waterway, and allied benefits are national in scope.

The project cost estimate is reviewed each year and updated in accordance with price level changes and the stage of planning. Based on past experience cost changes resulting from price level increases have been accompanied by increases in benefits.

INCREASE IN NAVIGATION BENEFITS

The increase in navigation benefits between the first and second budgetary submission to Congress was due primarily to adjustments made to comply with guidelines issued after enactment of and in compliance with the 1966 Transportation Act. In benefit evaluations made prior to the fiscal year 1970 evaluation, savings were measured on the basis of the least costly alternative which, in many cases, was the alternative Mississippi River water route, even though the traffic was moving by overland routing.

This method tended to minimize the savings. Prospective traffic have since been analyzed in accordance with section 7 of the 1966 Transportation Act, with savings computed to reflect the difference between rates shippers are actually paying via the mode being used and rates they probably would pay via the proposed waterway. This results in an increase in the unit savings. Also, the 50-year period of analysis was changed from 1976–2026 to 1980–2030 in accordance with the up-to-date construction schedule. The period of analysis should correspond

with the expected project life. This 4-year project delay resulted in a higher base year tonnage estimate. This comprehensive reevaluation of benefits and costs resulted in an increase in the benefit-cost ratio from 1.2 in the fiscal year 1969 budget request to 1.6 in the fiscal year 1970 budget request. For each subsequent annual budgetary submission to the appropriation committees, the navigation benefits have been adjusted to reflect rate differentials as of July 1. Construction costs have also been changed to reflect July 1 prices. This was done so that benefits and costs will be on the same time basis. The rate differentials as restudied each year are therefore those prevailing at the time of such study.

PROJECT BENEFITS

In discussing project benefits, it should be brought out that all benefits are not evaluated. Other benefits, to which dollar values were not assigned but are nevertheless real and significant are:

(*a*) Expansion of existing, and development of new, agricultural and industrial production under the stimulus of improved transportation facilities and lower transportation charges;

(*b*) Encouragement of decentralization of population and industry;

(*c*) Land enhancement by converting waterfront property to more productive use;

(*d*) Stimulation of higher standards of living and of foreign trade by promoting lower production costs due to low cost waterway transportation service.

(*e*) Value to national defense due to availability of added transportation capacity needed in time of war or other national emergencies. The 1966 reevaluation report pointed out that. "As demonstrated during World War II, inland waterways of the United States played an important role in transportation of strategic materials as well as commercial traffic, thus tending to relieve congestion of the overland carriers. It is impossible to predict in which section of the country additional transportation routes would be needed most urgently during a war, but after a war emergency arises, the important fact is that it is too late to start construction and place into service additional facilities of the magnitude needed. The Tennessee-Tombigbee route directly connects the heavily industrialized Tennessee Valley with the Black Warrior-Tombigbee Valley and the port of Mobile and adjacent harbors. Industries in these areas contributed heavily to the war effort during World War II and undoubtedly this would again be the case should another major emergency arise.

BAYOU BARTHOLOMEW AND TRIBUTARIES, ARK. AND LA.

Senator BIBLE. There is nothing in the budget, and local interests have requested $500,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $500,000 to initiate construction.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Bayou Bartholomew and Tributaries, Arkansas and Louisiana

Summarized Financial Data:

Estimated Total Appropriation Requirement	$24,900,000	
Future Non-Federal Reimbursement	570,000	
Estimated Federal Cost (Ultimate)		$24,330,000
Estimated Non-Federal Cost		1,570,000
Reimbursement: Recreation and Fish and Wildlife Enhancement	$ 570,000	
Other	1,000,000	
Total Estimated Project Cost		$25,900,000

Authorization: Rivers and Harbor Act of 1950 and Flood Control Act of 1966.

Location and Description: Bayou Bartholomew is an east bank tributary of the Ouachita River. Its source is in Jefferson County, Arkansas, northwest of Pine Bluff, and runs south to its junction with Ouachita River immediately upstream from Sterlington, Louisiana. The plan of improvement provides for closure of highwater outlets along the main channel of Bayou Bartholomew, construction of 10 detention reservoirs on tributaries along west escarpment of Bayou Bartholomew basin in Arkansas, and a system of 6 local levee units on the main stem in the Louisiana portion of the basin.

Proposed Operations: The amount of $500,000 would be used to purchase lands for the dam site, initiate acquisition of reservoir lands, and initiate construction of dam; all on Dam No. 544 at Prairie Creek.

Justification: The flood plain lands in the Bayou Bartholomew basin are very fertile and have the potential to produce high yields. In 1958, approximately 336,300 acres in the watershed were flooded and an additional 75,000 acres in the Boeuf and Tensas Rivers and Bayou Macon basins were flooded by waters that escaped from Bayou Bartholomew. The average annual flood damages under existing conditions are estimated at $256,000. The proposed reservoirs will reduce flooding on agricultural lands adjacent to the main stem of Bayou Bartholomew in Arkansas; the levees will provide needed protection for agricultural lands in Louisiana and the closure of highwater outlets along the main channel will prevent diversion of flow from Bayou Bartholomew to Boeuf and Tensas Rivers and Bayou Macon basins. The benefit-cost ratio is 1.5 to 1. Average annual benefits are estimated as follows:

Flood Control	$1,984,000
Recreation	250,000
Fish and Wildlife	106,000
Area Redevelopment	35,900
Total	$2,369,000

BELL FOLEY LAKE, ARK.

Senator BIBLE. The budget request was $50,000. The House committee has allowed $130,000 and local interests have requested $130,000. What is your capability on this project?

General MORRIS. Our capability on this project is $130,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $80,000?

General MORRIS. The additional amount would be used to advance completion of preconstruction planning 6 months.

DEGRAY LAKE, ARK.

Senator BIBLE. The budget request was $500,000. The House committee has allowed $500,000 and local interests have requested $800,000. What is your capability on this project?

General MORRIS. Our capability on this project is $800,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $300,000?

General MORRIS. The additional amount would be used to advance construction of recreation facilities.

DIERKS LAKE, ARK.

Senator BIBLE. The budget request was $900,000. The House committee has allowed $900,000 and local interests have requested $1,885,000. What is your capability on this project?

General MORRIS. Our capability on this project is $1,885,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $985,000?

General MORRIS. The additional amount would be used to advance the project so that it would complete in fiscal year 1974.

GILLHAM LAKE, ARK.

Senator BIBLE. The budget request was $2,200,000. The House committee has allowed $2,200,000 and local interests have requested $2,300,000. What is your capability on this project?

General MORRIS. Our capability on this project is $2,300,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $100,000?

General MORRIS. The additional amount would be used to initiate recreation facilities and thereby advance completion of the project by 6 months.

OPPOSITION

Senator BIBLE. Mr. Brent Blackwelder of the Environmental Policy Center has testified before this subcommittee. He stated with regard to Gillham Dam that he hoped the committee would look into the pos-

sibility of a dry dam instead of the presently proposed lake. Has the Corps done this?

Colonel MILLER. Yes, sir. The Tulsa District Engineer studied the dry lake alternative to the recommended project. These studies are discussed in the final environmental statement for Gillham Lake, Cossatot River, Ark. The statement of findings accompanying the final environmental statement recommended the authorized project over all other alternatives, including the dry lake alternative. The studies found that with the dry lake alternative, the water level would be down to the dry lake elevation more than 77 percent of the time. The valley is relatively narrow at this low elevation. The dry pool would therefore be subject to much greater vertical fluctuation than if the pool were at, a higher level where the area is wider. The objective of preserving that portion of the stream in its natural state, as nearly as possible, would be hampered by the periodic flooding that would have an adverse effect on the flora and fauna and natural esthetics of the lake area flooded. Because of the frequent water level changes, the fauna and flora of the system in the affected area would consist of species which are capable of withstanding floods or rapid invasion after a change from aquatic to terrestrial conditions, and vice versa. This ecosystem would be unlikely to ever develop the diversity, stability, or esthetically pleasing appearance of either an aquatic or terrestrial system.

The dry lake would provide little if any recreation potential and fish and wildlife enhancement, although it would have little effect on the stream fish population. The river, however, would be obstructed by the dam, and floodwaters would be stored at the time when conditions for canoeing are most favorable. Economic studies showed that the excess benefits over cost at the dry lake are $17,200,000 as compared to $26,210,000 for the approved project. If Gillham Lake were operated as a dry lake, it would result in a loss of $9,010,000 of excess benefits to the Cossatot River Basin. There would be no water supply benefits from Gillham Lake in a dry lake operation.

OUACHITA AND BLACK RIVERS, ARK. AND LA.

Senator BIBLE. The budget request was $4,800,000. The House committee has allowed $4,800,000 and local interests have requested $9,800,000. What is your capability on this project?

General MORRIS. Our capability on this project is $9,800,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $5,000,000?

General MORRIS. The additional amount would be used to advance acquisition of lands for Felsenthal Wildlife Refuge.

POSTEN BAYOU, ARK.

Senator BIBLE. There is nothing in the budget, and local interests have requested $60,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $60,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Posten Bayou, Arkansas

Summarized Financial Data:

Estimated Federal Cost		$2,230,000
Estimated Non-Federal Cost		290,000
Cash Contribution	$133,000	
Other	157,000	
Total Estimated Project Cost		2,520,000
Allocations to Date		0
Balance to Complete		2,230,000
Amount that could be utilized in FY 1974		60,000

Authorization: Section 201 of the 1965 Flood Control Act (Authorized 1970).

Location and Description: The project is located in southwest Arkansas, in Lafayette County, on the left descending bank of Red River. The plan of improvement is divided into two components: a. Construction of a major outlet from Posten Bayou, at approximately Mile 9.5, into Red River by the Corps of Engineers, and, b. interior drainage improvements to be accomplished by others. The major outlet will consist of a diversion channel approximately 2.5 miles in length, a control structure, and about 1.2 miles of tie-in levees to retain the protection against overflow from Red River afforded by the existing levee.

Proposed Operations: The amount of $60,000 would be used to initiate preconstruction planning.

Justification: A serious flood problem exists in portions of the Posten Bayou watershed where agricultural production sustains damages from headwater floods and future development of fertile lands is being curtailed by frequent ponding of runoff. Average annual damage from headwater flooding under existing conditions is estimated at $86,800. Construction of the proposed major outlet in conjunction with upstream improvements would prevent 86 percent of the damage and would increase net returns on 12,500 acres of open lands and make feasible the conversion of 2,570 acres from woodland to cropland. The benefit-to-cost ratio for both the major outlet and the overall plan is 1.3 to 1. The average annual benefits are presently estimated at $365,000 for flood control and $26,000 for area development.

Red River Levees and Bank Stabilization Below Dension Dam, Ark., La., and Tex., and Red Waterway, La.

Senator Bible. The budget request was $1,300,000. The House committee has allowed $1,300,000 and local interests have requested $4,200,000. What is your capability on this project?

General Morris. Our capability on this project is $4,200,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $2,900,000?

General Morris. The additional amount would be used to advance revetment work at Chandler Lake, Dilard Bend, and Oak, all in Arkansas and Bourbeaux, Abington, Fausse and Benton, all in Louisiana.

OPPOSITION

Senator Bible. Mr. Brent Blackwelder, the Washington representative of the Environmental Policy Center has requested that this project not be funded, as the more than 300 miles of channelization, dams, and related features pose a severe threat to wildlife habitat for several endangered species, including the red wolf, alligator, mountain lion, and southern bald eagle. He further stated that there is no mitigation plan accompanying project construction. Usually, the Corps includes mitigation in its projects. What are your plans?

Colonel Edgar. Sir, Mr. Blackwelder referred to the Red River levees and bank stabilization below Denison Dam project. The project name does not fit the project description, but rather the description fits the Red River Waterway, Louisiana, project; specifically, the Missisippi River to Shreveport segment. For the benefit of the committee, I will discuss both of these worthwhile projects. The Red River levees and bank stabilization below Denison Dam project consists of raising and strengthening existing and authorized Red River levees to provide flood protection against a flood approximately 20 percent greater than the flood of 1945. Bank protection works are also authorized to be constructed to preserve the flood control system at locations where levee setbacks are impossible or uneconomical.

FLOOD DAMAGE PREVENTED

Flood damage is prevented on cropland over an area of 447,000 cleared acres below Fulton, Ark., as a result of the combined effects of the levees and reservoirs of the Red River below Dension Dam project. Flood losses to structures and other noncrop losses are reduced throughout the 447,000 acres of improved land.

The authorized levee work is substantially complete. The remaining deficiencies are minor and of such character as to be readily susceptible to correction should the need develop during a flood fighting operation. The remaining bank protection work consists of stabilizing the existing channel where continued migration would result in a more costly levee setback to preserve the flood protection system. This work

consists of degrading the existing bank for stability and then hardening the channel to prevent further channel migration. The bank degrading operation generally required the immediate loss of about 50 feet of bank. However, this loss is considered minor since the natural migration tendencies of the river during high stages will result in bank losses greater than 50 feet in a matter of days. For instance, at one location during the present high stages the Red River channel has migrated over 450 feet. This represents not only a tremendous loss of land that could be productive to the interests of man but also a loss to any wildlife habitat that may have existed along the receding bankline.

The project was under construction at the time of implementation of NEPA so that the project continued under construction and without opposition. In continuing planning and construction for this project, the provisions of NEPA will be fully complied with. We have coordinated with the Bureau of Sport Fisheries and Wildlife in compliance with the Fish and Wildlife Act of 1958. The final EIS which includes this project, as well as all of the Red River Waterway project was submitted to CEQ on May 11, 1973.

Red River Waterway Project

The Red River Waterway, Mississippi River to Shreveport, La. project provides for a 9-foot by 200-foot navigation channel extending about 210 miles from the Mississippi River through Old River and Red River to the vicinity of Shreveport. Five locks and adjacent dams will provide the required lift of about 130 feet.

The project also provides for realining the banks of Red River from the Mississippi River to Shreveport, La., by means of dredging, cutoffs, and training works and stabilizing its banks by means of revetments, dikes and other methods.

Facilities to provide opportunities for recreation and for fish and wildlife development are an integral part of the project.

As stated by Mr. Blackwelder, several endangered species of wildlife are reported to exist in the study area; including the red wolf, alligator, mountain lion and southern bald eagle. The available habitat for these species will be reduced by the project and project induced clearing; however, the habitat is being destroyed at a faster rate by the river without the project than it would be with construction of the project and any clearing induced by construction. While no specific remedial measures have been included for endangered species, remedial protective and mitigation measures are a distinct part of the plan. Incorporated are our normal housekeeping provisions such as spoil confinement, vector control, handling of materials and sanitary facilities, and esthetical features.

Beyond this, the navigation channel was planned to follow existing channels insofar as possible to minimize land requirements and disruption of existing uses and facilities. Closure plugs will be installed in the upper end of bendway lakes created as the result of channel realinement. These structures will minimize filling by sedimentation and maximize the life of the oxbows. These measures will prevent the filling of the oxbows with sediment, thereby preserving the water areas

for recreational and fishing opportunities. Boat launching and parking facilities are also proposed at the lock and damsites which will assure access for the fishing, hunting and recreating public to the river. The bendways to be developed and preserved by the project will benefit the aquatic habitat and increase the outdoor recreational opportunity.

ALHAMBRA CREEK, CALIF.

Senator BIBLE. There is nothing in the budget. Local interests have requested $100,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $100,000 to initiate planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Alhambra Creek, California

Summarized Financial Data:

Estimated Federal Cost		$ 11,300,000
Estimated non-Federal Cost		1,270,000
Cash Contribution	$ 0	
Other	1,270,000	
Total Estimated Project Cost		12,570,000
Allocations to Date		0
Balance to Complete		11,300,000
Amount that could be utilized in FY 1974		100,000

Authorization: Flood Control Act of 1968 (H.D. 336/90/2)

Location and Description: Alhambra Creek is located in Contra Costa County, California, about 25 miles northeast of San Francisco. The proposed project provides for continuous channel improvements and diversion works along Alhambra Creek to prevent flood damages within the city of Martinez, California.

Proposed Operations: The amount of $100,000 could be used to initiate preconstruction planning.

Justification: The Alhambra Creek basin is located in a region subject to intensive winter storms. Two deaths have been caused by flooding within the basin. The 1958 flood, the flood of record, caused damages estimated at $416,000. It is estimated that, in the event of a standard project flood, damages of about $7,230,000 would occur, based on 1972 prices and conditions, and 660 acres would be inundated. The benefit-to-cost ratio is estimated to be 1.2 to 1. Average annual benefits are as follows:

Current estimate, July 1972 base (100-year life)

Average annual benefits	$ 520,000
Flood Control	411,000
Land Enhancement	109,000

BODEGA BAY, CALIF.

Senator BIBLE. Budgetary reserve will be available in fiscal year 1974, but there was no budget request. The House committee has included $50,000 and local interests have requested $50,000. What is your capability on this project?

General MORRIS. Our capability on this project is $50,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $50,000?

General MORRIS. The additional amount would be used to continue planning, sir.

BUCHANAN LAKE, CALIF.

Senator BIBLE. The budget request was $7 million. The House committee included $7 million, and local interests have requested $8,200,000. Could you use this amount for this project?

General MORRIS. Yes we could, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $1,200,000.

General MORRIS. The additional amount would be used to permit additional payments of anticipated contract earnings on the main dam. It would not permit any advancement in our overall completion.

BUTLER VALLEY DAM AND BLUE LAKE, CALIF.

Senator BIBLE. The budget request was $492,000. The House committee has included $492,000, and local interests have requested $900,000. What is your capability on this project?

General MORRIS. Our capability on this project is $900,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $408,000?

General MORRIS. The additional amount would be used to continue planning and would permit earlier completion of design on some separate features of the project but would not advance completion of design of the overall project, sir.

COTTONWOOD CREEK, CALIF.

Senator BIBLE. There is nothing in the budget. Local interests have requested $400,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $250,000 to initiate planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Cottonwood Creek, California

Summarized Financial Data:

Estimated Total Appropriation Requirement	$ 193,000,000	
Future non-Federal Reimbursement	- 145,350,000	
Estimated Federal Cost (Ultimate		$ 47,650,000
Estimated non-Federal Cost		145,350,000
Reimbursement (Irrigation)	5,980,000	
Reimbursement (M&I Water Supply)	138,200,000	
Reimbursement (Fish and Wildlife and Recreation)	1,170,000	
Other	0	
Total Estimated Project Cost		193,000,000
Allocations to Date		0
Balance to Complete		193,000,000
Amount that could be utilized in FY 1974		250,000

Authorization: Flood Control Act of 1970

Location and Description: The project is located on the main stem below the confluence of the North and Middle Forks and on the South Fork of Cottonwood Creek in Shasta and Tehama Counties, California. Cottonwood Creek drains into the Sacramento River midway between the cities of Redding and Red Bluff. The plan of improvement provides for two multiple-purpose projects, one at the Dutch Gulch site on the main stem, and one at the Tehama site on the South Fork. Dutch Gulch Lake would have a capacity of 1,100,000 acre-feet, and Tehama Lake a capacity of 900,000 acre-feet, for a combined total storage of 2,000,000 acre-feet.

Proposed Operations: The amount of $250,000 could be used to initiate preconstruction planning on the first stage of the project -- the Dutch Gulch Lake unit.

Justification: The project will provide flood protection to about 8,000 acres of predominantly agricultural lands along lower Cottonwood Creek; will reduce flood flows in Sacramento River, thereby providing increased flood protection to some 490,000 acres downstream to Colusa; will improve agricultural crop use; and reduce bank erosion. Average annual flood damages along Cottonwood Creek are estimated at $275,000; flood damages in those downstream areas affected by Cottonwood Creek flows are estimated at $3,432,000 per year. The project would provide water needed for municipal and industrial purposes in other areas of the State, for irrigation in the local service area, and would provide a wide range of outdoor recreational activities, including a warm water fishery in the lakes, and enhancement of the anadromous fishery in Cottonwood Creek, Sacramento River, and ocean waters. The benefit-to-cost ratio is 1.07 to 1. The average annual benefits are listed below:

Current estimate, July 1972 base (100-year life)

Average annual benefits	$ 13,186,000
Flood Control	2,234,000
Municipal and Industrial Water Supply	8,216,000
Irrigation	311,000
Recreation	307,000
Fish and Wildlife	477,000
Area Redevelopment	1,641,000

Dry Creek (Warm Springs) Lake and Channel, Calif.

Senator Bible. The budget request was $3,850,000. The House committee has included $2,650,000, and local interests have requested $6,850,000. What is your capability on this project?

General Morris. Our capability on this project is $2,650,000, the same as the House amount. Delays in finalization of the environmental impact statement for the project have caused delay in award of new contracts and therefore reduced our requirements for fiscal year 1974.

Goleta and Vicinity, Calif.

Senator Bible. There is nothing in the budget. Local interests have requested $100,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $100,000 to initiate planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Goleta and Vicinity, California

Summarized Financial Data:

Estimated Federal Cost		$ 17,700,000
Estimated non-Federal Cost		5,320,000
Cash Contribution	$ 580,000	
Other	4,740,000	
Total Estimated Project Cost		23,020,000
Allocations to Date		0
Balance to Complete		17,700,000
Amount that could be utilized in FY 1974		100,000

Authorization: Flood Control Act of 1970 (H.D. 91-392)

Location and Description: The project will be located in the Goleta Valley area in Santa Barbara County, California. The plan of improvement provides for about 1.3 miles of channel clearing and 11.2 miles of channel improvements. Channel clearing would be accomplished on Maria Ygnacio, San Jose, San Pedro, Las Vegas, and Carneros Creeks. Construction of channel improvements would be accomplished on Atascadero, Maria Ygnacio, San Jose, Las Vegas, San Pedro, Carneros and Tecolotito Creeks.

Proposed Operations: The amount of $100,000 could be used to initiate preconstruction planning.

Justification: The Goleta area is rapidly urbanizing and is subject to frequent severe flooding. The flood of January 1967 caused damages of $760,000 in the project area. The floods of January and February 1969 caused damages of about $530,000 in the project area. Should a standard project flood occur prior to construction of the project, it is estimated that damages of about $10,746,000 would result. The total value of lands and improvements in the area to be protected by the project is estimated at $65,340,000 (1972 prices). The benefit-to-cost ratio is presently estimated at 1.6 to 1. The average annual benefits, all flood control, are estimated to be $2,375,000.

LYTLE AND WARM CREEKS, CALIF.

Senator BIBLE. The budget request was $3,370,000. The House committee has included $3,370,000, and local interests have requested $5,670,000. What is your capability on this project?

General MORRIS. Our capability on this project is $5,670,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $2,300,000?

General MORRIS. The additional amount would be used to advance award of the next two scheduled construction contracts and would advance completion of the overall project by 3 months, one flood season earlier than now scheduled.

MARYSVILLE LAKE, CALIF.

Senator BIBLE. Budgetary reserve will be available in fiscal year 1974, but there was no budget request. Local interests have requested $350,000. What is your capability on this project?

General MORRIS. We have no additional capability over the $550,000 which will be released from reserve to continue planning in fiscal year 1974, Mr. Chairman.

NAPA RIVER BASIN, CALIF.

Senator BIBLE. Budgetary reserves will be available in fiscal year 1974, but there was no budget request. Local interests have requested $200,000. What is your capability on this project?

General MORRIS. Local interests will not be able to fulfill their cooperation requirements in fiscal year 1974 and consequently we have no additional capability, sir.

NEW MELONES LAKE, CALIF.

Senator BIBLE. The budget request was $18 million. The House committee has allowed $16 million, and local interests have requested $18 million. What is your capability on this project?

General MORRIS. Award of our main dam contract has been delayed by litigation. In view of this delay our capability has been reduced to $16 million, the same as the House amount.

OPPOSITION

Senator BIBLE. Mr. Brent Blackwelder, representing the Environmental Policy Center and the Sierra Club, has furnished this committee with a detailed report expressing opposition to the New Melones project among others. This report indicates that the California State Water Resources Control Board rendered a decision that prohibits filling the reservoir because the water won't be needed outside the four counties in the basin. The report claims that under these restrictions the benefit-cost ratio for New Melones would be reduced to 0.5 to 1. Would you comment on the State board's decision and its effects on the project?

Colonel DRISCOLL. Yes, sir. I would like first to point out that the broad question regarding the applicability of decisions of the State Water Resources Control board in regulating the operation of federally authorized and funded projects is a matter before the courts at this time. The Federal position expressed by the Justice Department in its brief in the ninth circuit court of appeals, is that neither the construction nor operation of a congressionally authorized project are subject to conditions imposed by State laws which are inconsistent with the clear directives of Congress. Resolution of the matter could conceivably take several years. However, even assuming that the board's decision on New Melones is found to be governing, it is important to note that this decision places only conditional restrictions on the amount of water to be stored. The decision would permit additional storage when the need for consumption use of water would outweigh any damages to resources, such as whitewater reaches, above the dam and when there is a firm commitment for delivery of the water. In this regard, it is very significant that, in its decision, the board states: ". . . there is a demonstrated need for the full yield of the project in the four basin counties at some time in the future. . . ." Thus, even under the terms of the board's decision, should it be upheld in court, the full conservation yield of the project could be expected to be utilized in the future. The major effect of the board's decision would be to render the authorized project purpose of power generation economically infeasible by prohibiting storage of an inactive pool that would provide a sufficient water level behind the dam for power production during critical power periods.

CONTRASTING COST-BENEFIT RATIO

We have conducted an economic analysis of the New Melones project assuming the applicability of the State board's decision. We find that the elimination of costs and benefits assigned to power and the projection of when other project benefits would probably be forthcoming results in a project with a benefit-cost ratio of about 1.3 to 1. This, of course, contrasts quite sharply with the 0.5-to-1 figure quoted by those who oppose the project. Although we are not privy to the details of the economic analysis performed by Mr. Blackwelder, it would seem that the benefit-cost ratio he reached could only be calculated by retaining the cost of the power generating facilities while subtracting the benefits accruing thereto and ignoring the fact that the State board's decision provides for the accumulation of future benefits related to storage of water as needed for irrigation and controlled release purposes. In any event, we must take serious exception to Mr. Blackwelder's economic evaluation of the New Melones project assuming the State water resources control board's decision becomes operative.

INUNDATION OF VALUED WHITEWATER RECREATION AREA

Senator BIBLE. Mr. Blackwelder's report indicates that the project would inundate a highly valued whitewater recreation area and that the corps is attempting to offset this loss using flatwater recreation benefits from the reservoir to justify the project. The report states further that both Governor Reagan and Senator Tunney have recommended that the project not go forward unless mitigation for this loss

is provided but that the Corps has no intention of even investigating mitigation possibilities until 1974. What are your comments on the loss of whitewater recreation and the Corps' mitigation plans?

Colonel DRISCOLL. As stated previously before this committee, the corps fully recognizes that the loss of the whitewater reach is an unavoidable adverse effect of the project. This matter has been fully discussed and evaluated in the environmental impact statement. In making its recommendations to the Congress, the Corps has never tried to convey the impression that whitewater recreation losses would be offset solely by the development of flatwater recreation opportunities. On the contrary, the Corps recognizes the unique nature and value of the whitewater reach of the Stanislaus River and has made a commitment to both Governor Reagan and Senator Tunney that potential whitewater recreation reaches along other portions of the river will be developed to the maximum extent possible consistent with the authorities available to us.

Mitigation studies are currently underway and are scheduled for completion in 1975, long before the existing whitewater areas would be affected by the project. A 4-mile whitewater reach below the dam has already been identified as having high potential for development. Governor Reagan has since clarified the State's position on the project in a letter of December 26, 1972, to State Attorney General Evelle Younger. In his letter, which was subsequently submitted to the circuit court of appeals considering the New Melones litigation, he states:

> . . . considering the fact that congressional authorization (of the New Melones project) has been supported for many years by the State of California, and that delay of commencement of construction could not only increase the total cost of the project considerably but also delay urgently needed flood control and other benefits, I do not believe there is sufficient justification to support delay of commencement of construction, provided the requirements of the court are met.

I might add here that, while recognizing the loss of recreational benefits afforded by the reach of whitewater this project would inundate, the Corps must also give full consideration to the total benefits the project would provide, amounting to about $14 million annually. These offsetting benefits are certainly not limited to the 900,000 annual visitor-days of recreation use to be afforded by the lake, but include flood control, water conservation, power, water quality, and fish and wildlife enhancement as well.

IRRIGATION BENEFITS QUESTIONED

Senator BIBLE. In his report, Mr. Blackwelder questions the irrigation benefits attributed to the New Melones project. He points out that the project is being built to store water for the still unauthorized East Side Division irrigation project and that the result will be to bring more land under irrigation and aggravate the crop surplus problems. We received similar expressions of opposition last year. What are your current views on this?

Colonel DRISCOLL. As authorized by the Congress and sanctioned by the California State Legislature, the project is being constructed for operation as an integral part of the Central Valley project. Our past views on this are unchanged in that nothing in the authorizing legislation refers to the proposed East Side Division. The yield from New

Melones is needed within the service area of the Central Valley project. In fact, as mentioned earlier, it will eventually be required within the immediate area of the four basin counties. The Bureau of Reclamation, to our knowledge, has not changed its estimate that about 85 percent of the irrigation yield would be used to substitute for existing groundwater overdraft, not to promote new irrigated acreage. The remainder would be available to support the development of new farmlands but well within the context of the needs projected by both the State and the Department of Agriculture.

UNIQUE GEOLOGICAL PHENOMENA

Senator BIBLE. Mr. Blackwelder's report quotes Dr. William Wright, professor of geology at Sonoma State University, as pointing out the existing accessibility and concentration of unique geological phenomena in the Stanislaus River Canyon. It further indicates that a finding by the National Speleological Society shows New Melones would inundate many limestone caves, including some of the largest and most unusual in California. The report also calls attention to losses in wildlife habitat with almost no mitigation and the inundation of an important reach of trout stream. How does the Corps view these losses and what are its plans for mitigation?

Colonel DRISCOLL. The geological formations that would be inundated by the project, of course, cannot be compensated for. However, those that remain above the level of the lake will be rendered even more accessible for study and many similar formations downstream of the project will be unaffected. Regarding the limestone caves, the National Speleological Society reports that New Melones would inundate only two significant sites while affording the opportunity to protect many others from vandalism. The society endorses Corps proposals for protecting the caves in the vicinity of the project.

The existing wildlife habitat that will be inundated by the project will be compensated for by purchase and management of areas around the reservoir and by enforced protection of habitat along the lower reaches of the river. Authority has been obtained for the purchase of 3,200 acres in the vicinity of the reservoir, and studies are presently being conducted as to the appropriateness of requiring easements on about 4,000 acres along the lower river. The fishery situation should, on the whole, be vastly improved by the project. Existence of the dam with its yield of quality water would permit a trout fishery to be established downstream where none now exists, while the reservoir itself would also support a trout fishery. In addition, the anadromous salmon resource in the Stanislaus River would be enhanced through the provision of adequate flows.

APPRAISAL OF OPPOSITION CHARGES

Senator BIBLE. Mr. Blackwelder's report concludes by indicating that the work on New Melones completed to date has been a waste of money, that the project is being opposed in court by environmental groups, and that petitions containing over 120,000 names request the preservation of the Stanislaus River in its natural condition. The report indicates that a much smaller dam that would preserve the most significant reaches of the Stanislaus River is feasible by the

Corps' own admission and would be an acceptable alternative. This committee would appreciate your appraisal of the nature and extent of the support and opposition regarding this project as currently formulated. We would also like your comments on the smaller project proposal forwarded by Mr. Blackwelder.

Colonel DRISCOLL. Sir, it seems quite apparent, from the testimony offered before this committee in recent years opposing the New Melones project and from other expressions of opposition directed to the Corps or otherwise brought to our attention, that the key element of concern to project opponents is the matter of the loss of the whitewater reach of the river. While other negative aspects of the project have been expounded, it would seem to us that, if the project did not impinge on the existing whitewater reach of the river, no opposition of significance would be voiced. It is our feeling that the Corps has fully recognized and evaluated the loss to the American public of the inundation of the reach of natural river involved. We fully intend to compensate in kind for this loss to the extent of our ability but also recognize that, in this regard, total replacement is not achievable. However, we must also recognize that the needs that gave rise to congressional authorization and funding of the New Melones project reflect a much broader scope and depth of consideration than just the preservation of a reach of natural river. If, in our estimation, the accumulation of total project benefits to be produced by this project did not decidedly offset its negative effects, the Corps would be a leader in advocating its abandonment or revision. I would be pleased to submit for the record a summary of what we know concerning the nature and extent of both the opposition to and support for this project.

I think it would be fair to say at this point that, while there has been a significant voicing of opposition to the project by individual citizens and environmental groups, the local and State entities duly authorized to speak for the people they represent are in full support of immediate continuance of the project as authorized. It should also be noted that considerable support for the project has been expressed by environmentally-oriented groups or directly concerned segments thereof. Regarding the suggestion that a much smaller dam would be advisable, the Corps has never advocated this alternative as a viable solution to the present and anticipated future needs of the area. A smaller project that would substantially preserve the upstream whitewater reach would come nowhere near providing other benefits to the extent of making the project economically sufficient.

[The summary of significant opposition and support relative to the New Melones project follows:]

SUMMARY OF KNOWN LOCAL OPPOSITION AND SUPPORT

NEW MELONES PROJECT

Opposition. Opposition to the project was registered by the Environmental Defense Fund and the Sierra Club in a lawsuit in Federal District Court seeking to prevent the construction of the main dam based upon non-compliance with the National Environmental Policy Act. Following a decision by the District Court that would permit construction to proceed, the plaintiffs appealed to the Ninth Circuit Court of Appeals where a decision is pending.

Various environmental groups and whitewater recreation interests have expressed opposition or concern in their comments on the Draft Environmental Statements or in letters to the President, Congress, Federal agencies, and newspapers.

Letters bearing signatures numbering in the thousands have been addressed to the President by private citizens nationwide expressing opposition to the project. A high percentage of these made use of standard post cards or formats. The preponderant concern has been the loss of the whitewater recreation reach above the dam. Petitions are also known to have been circulated nationwide in opposition to the project. Although the number of signatures is reportedly large, the petitions are not available for analysis.

Support. Firm support for continuing the construction of New Melones without delay has recently been reaffirmed by the Governor of California, the California Water Commission, the State Reclamation Board, and the

California State Assembly. A supporting resolution by the State Senate has recently been approved by the Committee on Water with favorable action by the entire Senate expected momentarily.

In the litigation against New Melones, there are over thirty intervenors in support of the United States. These include four counties; six cities; four water, sanitary, or reclamation districts; eight water or land use associations; the Associated General Contractors of California; the State Building and Construction Trades Council of California; and local citizens.

Among environmental groups, the Yokut Wilderness Group, the Mother Lode Chapter of the Sierra Club, the Associated Sportsman of California, and the Stanislaus Speleological Association recently expressed support for the project if the planned environmental considerations are carried out. A similar expression of support was made by the Ecology Action Educational Institute with the indorsement of local members of the Audubon Society, Sierra Club, California Native Plant Society, Stanislaus Fly Fishermen, and Yokut Wilderness Group.

OAKLAND HARBOR, CALIF.

Senator BIBLE. There is nothing in the budget. Local interests have requested $450,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $445,000 to complete construction of the active portion of the project.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Oakland Harbor, California

Summarized Financial Data:

Estimated Federal Cost		$ 7,030,000
Estimated non-Federal Cost		1,800,000
Cash Contribution	$ 532,000	
Other	1,268,000	
Total Estimated Project Cost		$ 8,830,000
Allocations to Date		$ 3,038,770
Balance to Complete		3,991,230
Amount that could be utilized in FY 1974		$ 445,000

Authorization: River and Harbor Act of 1962 (H.D.353/87/2)

Location and Description: Oakland Harbor is located on the eastern side of San Francisco Bay opposite the City of San Francisco, California. The plan of improvement provides for deepening to 35 feet, the Inner Harbor Channel from the entrance to Fortman Basin only. Within this reach, the lower part of the North Channel and the Turning Basin would also be deepened to 35 feet. The remaining portion of the project above Fortman Basin has questionable economic justification and construction has been indefinitely postponed.

Proposed Operations: The amount of $445,000 could be used to complete the active portion of the project in FY 1974.

Justification: Oakland Harbor is one of five commercial deep-draft harbors which make San Francisco Bay one of the major shipping centers of the Pacific Coast. The harbor serves not only the entire Bay Area but also Northern California and a considerable portion of the western United States. The highly developed port area includes 64 commercial wharves, seven shipbuilding and repair yards and numerous small-boat moorings. Existing channel depths are inadequate and hazardous for modern deep-water general-cargo vessels with drafts ranging from 28 to 34 feet. These vessels cannot enter or leave the Inner Harbor at all stages of tide. Waterborne commerce through Oakland Harbor in 1971 was 3,200,000 tons. The benefit-to-cost ratio is estimated to be 1.9 to 1. The average annual benefits, all navigation, are estimated at $814,000.

SACRAMENTO RIVER AND MAJOR AND MINOR TRIBUTARIES, CALIFORNIA

Senator BIBLE. Budgetary reserve will be available in fiscal year 1974, but there was no budget request. Local interests have requested $50,000. What is your capability on this project?

General MORRIS. Budgetary reserve funds will be adequate for all work scheduled for fiscal year 1974, sir, and consequently we have no additional capability.

SACRAMENTO RIVER BANK PROTECTION PROJECT, CALIF.

Senator BIBLE. The budget request was $1,400,000. The House committee has included $1,400,000, and local interests have requested $2,000,000. What is your capability on this project?

General MORRIS. Our capability on this project is $2,000,000, Mr. Chairman, but the additional capability is subject to an increase in the current monetary authorization for this project.

Senator BIBLE. What would be accomplished with the additional $600,000?

General MORRIS. The additional amount would be used to initiate phase II of the project 1 year earlier than now scheduled, sir.

SAN DIEGO HARBOR, CALIF.

Senator BIBLE. The budget request was $400,000. The House committee has allowed $400,000, and local interest have requested $800,000. What is your capability on this project?

General MORRIS. Our capability on this project is $400,000, the same as the budget, Mr. Chairman.

SAN DIEGO (SUNSET CLIFFS), CALIF. (SEGMENT A)

Senator BIBLE. There is nothing in the budget. Local interests have requested $25,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $25,000 to initiate planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: San Diego (Sunset Cliffs), California (Segment A)

Summarized Financial Data:

Estimated Federal Cost		$ 1,040,000
Estimated non-Federal Cost		1,040,000
Cash Contribution	$ 1,040,000	
Other	0	
Total Estimated Project Cost		$ 2,080,000
Allocations to Date		0
Balance to Complete		1,040,000
Amount that could be utilized in FY 1974		$ 25,000

Authorization: River and Harbor Act of 1966 (HD 447/89/2)

Location and Description: The site of the improvement is located on the Pacific Ocean shoreline within the city limits of San Diego, in San Diego County, California. The proposed project provides for the construction of a protective recreational beach, generally 4,000 feet long and 200 feet wide, by the deposition of about 720,000 cubic yards of suitable beach material along the shore and the construction of four stone groins to contain the fill.

Proposed Operations: The amount of $25,000 could be used to initiate preconstruction planning.

Justification: The project will provide protection of critically eroded bluffs along the shore in the Ocean Beach-Sunset Cliffs area. Considerable erosion is occurring in many areas along Sunset Cliffs, and is threatening houses, public streets and utilities. A comparison of changes in the bluff line over a 35-year period reveals an average annual rate of erosion of from 1 to 3 feet. Reduction of the beach area at the base of the cliffs has exposed the toe to more direct wave action and the rate of erosion is expected to increase. The benefit-to-cost ratio is estimated to be 1.5 to 1. Average annual benefits are as follows:

Current Estimate, July 1972 Base (50-year life)	
Average Annual Benefits	$ 217,000
Beach Erosion (Prevention of Damages)	58,300
Recreation	158,700

SAN LUIS REY RIVER, CALIF.

Senator BIBLE. There is nothing in the budget. Local interests have requested $100,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $100,000 to initiate planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: San Luis Rey River, California

Summarized Financial Data:

Estimated Federal Cost		$ 9,990,000
Estimated non-Federal Cost		
Cash Contribution	$ 1,110,000	3,810,000
Other Costs	2,700,000	
Total Estimated Project Cost		$13,800,000
Allocations to Date		$ 0
Balance to Complete		9,990,000
Amount that could be utilized in FY 1974		$ 100,000

Authorization: House and Senate Public Works Committees Resolutions dated 15 and 17 December 1970, respectively, under provisions of Section 201 of Flood Control Act of 1965 (SD 91-106)

Location and Description: The project will be located on the San Luis Rey River in the vicinity of the city of Oceanside, San Diego County, California. The plan of improvement provides for about 7.2 miles of channel improvements along the San Luis Rey River from Murray Road to the ocean and about 800 feet of stone revetted levee on the south bank from the railroad to the ocean.

Proposed Operations: The amount of $100,000 could be used to initiate preconstruction planning.

Justification: The proposed project would alleviate serious flood problems in the lower San Luis Rey River Valley, including portions of the city of Oceanside. The total value of lands and improvements in the flood plain is estimated at $50,000,000 (July 1972). Construction of the proposed project would permit optimum development of the flood plain which cannot be developed to its full potential without flood protection. The benefit-to-cost ratio is currently estimated at 1.4 to 1. The average annual benefits are as follows:

Current Estimate July 1971 Base (100-year life)	
Average Annual Benefits	$1,135,000
Flood Control	$ 511,000
Increased Land Utilization	624,000

TAHQUITZ CREEK, CALIF.

Senator BIBLE. The budget request was $300,000. The House committee has not included any funds, and local interests have requested $300,000. What is your capability on this project?

General MORRIS. Mr. Chairman, it now appears that it may be necessary to significantly modify our design and we no longer anticipate being able to award construction contracts early enough to require additional funds in fiscal year 1974, consequently our capability for fiscal year 1974 has been reduced to zero.

UNIVERSITY WASH AND SPRING BROOK, CALIF.

Senator BIBLE. The budget request was $20,000. The House committee has allowed $20,000, and local interests have requested $70,000 for planning. What is your capability on this project?

General MORRIS. Our capability on this project is $70,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $50,000?

General MORRIS. The additional amount would be used to continue planning and would permit more orderly development of phase I of the general design memorandum.

DANBURY, CONN.

Senator BIBLE. There is nothing in the budget, the House Committee has allowed $700,000, and local interests have requested $700,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $700,000 to initiate construction.

Senator BIBLE. Would you submit a statement for the record?

General MORIS. Yes, sir.

[The statement follows:]

Project: Danbury, Connecticut

Summarized Financial Date:

Estimated Federal Cost		8,500,000
Estimated non-Federal Cost		1,850,000 1/
Cash Contribution	0	
Other Costs	1,850,000 1/	
Total Estimated Project Cost		10,350,000
Allocations to date		430,000
Balance to Complete (Corps of Engineers)		8,070,000
Amount that could be used in FY 1974		700,000

1/ In addition, the State of Connecticut and the City of Danbury have expended a total of $2,153,000 for flood control measures consisting of channel improvement and replacement of highway bridges at upstream and downstream areas contiguous to recommend Federal project.

Authorization: 1965 Flood Control Act

Location and Description: This project is located on the Still River in the City of Danbury, Fairfield County, Connecticut. The project provides for rectangular reinforced concrete section, riprapped trapezoidal channel, replacement of four railroad and two highway bridges, and removal of a privately owned bridge.

Proposed Operations: The amount of $700,000 would provide for initiation of construction.

Justification: Flood waters converge on the City of Danbury from the drainage area of the Still River, overflowing the river banks and causing severe damage to commercial and industrial establishments. A recurrence of the record flood (October 1955) under present economic conditions would cause losses estimated at $6,700,000 within the 90-acre area proposed for protection. The area again experienced extensive flooding in early 1973. These losses would be eliminated by the project construction.

Immediately upstream and contiguous to the project, the City of Danbury is constructing an urban renewal project called "The Central Flood Urban Renewal Plan". The plan includes improvement of the Still River and Padanarum Brook Channels at a cost of $1,416,000. These improvements have been designed to be compatible with the Corps flood control plan. The Connecticut Water Resources Commission and the City of Danbury have completed a flood control project downstream of the recommended project at a cost of $436,000. The Federal project will join these completed channels to provide protection to the City.

The benefit-to-cost ratio is 1.5 to 1. Average annual benefits are estimated at $530,000,as follows:

Flood Control	$ 407,500
Redevelopment	55,000
Urban Renewal	67,500
Total	$ 530,000

Inland Waterway, Delaware River to Chesapeake Bay, Del. and Md. (C. & D. Canal), Pt. II

Senator Bible. Budgetary reserve will be available in fiscal year 1974, but there was no budget request. Local interests have requested $7,500,000. What is your capability on this project?

General Morris. Our capability on this project is $3,100,000, Mr. Chairman.

Senator Bible. What would be accomplished with the $3,100,000?

General Morris. The additional amount would be used to continue construction and advance project completion 6 months.

OPPOSITION

Senator Bible. Mr. Brent Blackwelder speaking on behalf of the Environmental Policy Center, testified in opposition to the Inland Waterway, Delaware River to Chesapeake Bay, Del. and Md. He indicated that the possible adverse effects of this project on the important resources of the Chesapeake Bay have not been adequately studied.

Colonel Irving. Dredging the final section of the canal was delayed in fiscal year 1973 pending receipt of a preliminary report concerning ecological effects of the water transfer between Chesapeake Bay and Delaware Bay as a result of the enlargement of the canal. The preliminary report from the University of Maryland concerning the physical parameters, tolerances of various fish eggs and larvae, descriptions of biological population, and spawning patterns revealed no significant damage to be expected from the increased flows. Continued study during second spawning season will be reviewed in an effort to substantiate these preliminary funds. The final report is anticipated by September 30, 1973. Additional mathematical and hydraulic model tests for both the 27- and 35-foot canals have also been completed by the waterways experiment station. These studies have substantiated the anticipated physical effects of channel enlargement.

Canaveral Harbor, Fla.

Senator Bible. There is nothing in the budget, and local interests have requested $500,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $125,000 which would permit a 3-month advance in the award of a construction contract for the harbor extension from mile 1.2 to mile 1.5.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Canaveral Harbor, Florida

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$11,700,000
Estimated non-Federal Cost		1,119,000
Cash Contribution	0	
Other	$1,119,000	
Total Estimated Project Cost		12,819,000
Allocations to date		5,900,000
Balance to Complete		5,800,000
Amount that could be used in FY 1974		125,000

Authorization: River and Harbor Act of 1962.

Location and Description: Canaveral Harbor is located just south of Cape Kennedy, approximately midpoint of the east coast of Florida about 145 miles south of Jacksonville and 70 miles north of Fort Pierce Harbor. The authorized project provides for maintaining the 36- and 34 foot-deep ocean entrance channel and the 33-foot-deep turning basin as enlarged in 1956-57; construction and operation of a sand transfer plant; relocating the primeter dike about 4,000 feet westward and extending the harbor westward; enlarging the barge channel to 12 feet deep and 125 feet wide from the turning basin to the Intracoastal Waterway; and, constructing the previously authorized barge lock at the relocated site adapting current standards for lock dimensions of 56 feet wide and 400 feet long.

Proposed Operations: The amount of $125,000 would permit a 3 month advance in the award of a construction contract for the harbor extension, mile 1.2 to 1.5.

Justification: Development and operation of the rocket-launching facility on Cape Kennedy and the development of Patrick Air Force Base, 10 miles south of Canaveral Harbor, and tracking stations on islands offshore has resulted in a population increase in the tributary area from 162,000 in 1940 to 827,000 in 1970. During the 1960's, there was a major expansion of the rocket-launching facility on Cape Kennedy to accommodate the space program. Commerce has increased at the harbor from 374,000 tons in 1961 to 1,999,000 tons in 1971. Improvements are considered essential to provide adequate facilities for prospective commerce. Average annual benefits are estimated at $1,391,000.

The benefit-cost ratio is 1.5 to 1.

CROSS-FLORIDA BARGE CANAL

Senator BIBLE. There is nothing in the budget, and local interests have requested $1,500,000, $1 million for construction and $500,000 for recreation facilities at Lake Oklawaha. Do you have a capability for this project?

General MORRIS. Mr. Chairman, as you know the President halted construction on the Cross-Florida Barge Canal project on January 19, 1971. As long as that order remains in effect the Corps has no capability to proceed with further construction.

We also have no capability for development of additional recreation facilities at Lake Oklawaha. The lake is being maintained at its present high level, of 18 feet m.s.l. on order of the Jacksonville District Court, pending further judicial action in the cases relating to the President's halt of the barge canal project.

The level at which the lake will be maintained, that is high level, low level, or no impoundment, and the type of recreation facilities that would be suited to the project area are unknown at this time. Resolution of the matter of feasible recreational development must await the outcome of the current litigation and congressional action on the administration's proposed legislation to designate the Oklawaha River as a study river for potential inclusion in the National Wild and Scenic River System.

DUVAL COUNTY, FLA.

Senator BIBLE. Budgetary reserve funds in the amount of $90,000 will be available in fiscal year 1974, but there was no budget request. The House committee has allowed $30,000 and local interests have requested $30,000. What is your capability on this project?

General MORRIS. Our capability on this project is $30,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $30,000?

General MORRIS. The additional amount would be used to continue preconstruction planning. This would advance completion of planning by 3 months.

FOUR RIVER BASINS, FLA.

Senator BIBLE. The budget request was $1,500,000, and local interests have requested $4,500,000. What is your capability on this project?

General MORRIS. Our capability on this project is $1,500,000, Mr. Chairman, the budget amount.

Senator BIBLE. You cannot use any additional funds?

General MORRIS. No, sir.

PANAMA CITY HARBOR, FLA.

Senator BIBLE. Budgetary reserve funds in the amount of $50,000 will be available in fiscal year 1974, but there was no budget request. The House committee has allowed $75,000 and local interests have requested $250,000. What is your capability on this project?

General MORRIS. Our capability on this project is $60,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $60,000?

General MORRIS. The additional amount would be used to complete preconstruction planning.

LOWER AUCHUMPKEE CREEK LAKE, GA.

Senator BIBLE. There is nothing in the budget, and local interests have requested $1 million. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $150,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Lower Auchumpkee Creek Lake, Georgia

Summarized Financial Data:

Estimated Total Apprn. Requirement	$84,800,000	
Future non-Federal Reimbursement	38,950,000	
Estimated Federal Cost (Ultimate-Corps of Engineers)		$45,850,000
Estimated non-Federal Cost		38,950,000
Reimbursement:		
Power	$ 36,936,000	
Recreation & Fish & Wildlife Enhancement	2,014,000	
Total Estimated Project Cost		84,800,000
Allocations to date		0
Balance to Complete (Corps of Engineers)		84,800,000
Amount that could be used in FY 1974		150,000

Authorization: 1965 Flood Control Act.

Location and Description: The project will be located on the Flint River in Taylor and Crawford Counties about 18 miles southeast of Thomaston, Georgia. The reservoir will extend 22.3 miles to the Lazer Creek Dam in Talbot and Upson Counties. The proposed improvements include a dam with a total length of 4,920 feet consisting of a concrete gated spillway with non-overflow abutments extending across the river channel that would be connected to high ground on the left and right banks by earth dikes; and a power plant with two units of 40,500 kw. each.

Proposed Operations: The amount of $150,000 could be used to initiate preconstruction planning.

Justification: Lower Auchumpkee Creek dam is the lowermost of the three headwater dams proposed for the initial development of the Flint River for flood control, hydro-power and other purposes. The low-lying lands along the Flint River are subject to frequent and sometimes severe flooding. The flood plain area contains about 111,500 acres of which 107,500 are rural and 4,000 are urban. Based on current values the maximum flood of record, March 1929, caused damages estimated at $2,040,000. Lower Auchumpkee Creek Lake would provide partial protection for the entire area from its location to Bainbridge. It would produce 122,800,000 kw.-hrs. of electric energy annually in an area where there is an ever increasing need and where there would be a ready market for the power. The reservoir would provide an attractive recreational site in an area where there are not readily available facilities.

Fourteen adjacent counties are designated redevelopment areas under section 401 (a) of PL 89-136. About 70 percent of the work force required for construction and operation and maintenance would be employed from the redevelopment areas. Large quantities of fuel and materials would be procured locally. Therefore, construction of the project would afford substantial relief in unemployment and would aid the economy of the area materially. The benefit-cost ratio is 1.2 to 1. Average annual benefits are broken down as follows:

	Flood Control	$ 550,000
	Power	2,482,000
1/	Navigation Downstream	15,000
	Fish and Wildlife	276,000
	General Recreation	800,000
	Area Redevelopment	450,000
	Total annual benefits	$4,573,000

1/ Reduced maintenance below Jim Woodruff Lock and Dam.

Spewrell Bluff Lake, Ga.

OPPOSITION

Senator Bible. Colonel Irving, would you respond to statements made in "Disasters in Water Development," by Mr. Brent Blackwelder on the Spewrell Bluff project?

Colonel Irving. Yes, sir. The proposed Spewrell Bluff project would inundate a large portion of the fall line topography which is a transition zone between the Piedmont and the Coastal Plain physiographic provinces. Because this is a transition zone, flora and fauna coexist that are not normally associated with each other. The loss of this unusual habitat would be an adverse impact and will be covered in the environmental impact statement for the project. The position of the State agencies on the project is mixed and the official position of the State has not been decided by the Governor. The opposition by the Georgia Department of Planning and Budget entered the picture in February 1973. Their opposition apparently stemmed from a misunderstanding of the State's need to make a financial commitment in order for the project to be implemented. A letter clarifying this matter was furnished to the Department of Planning and Budget and to Governor Carter.

The Spewrell Bluff project was authorized as a multiple-purpose project; the purposes being flood control, recreation, power, navigation, and fish and wildlife. The benefits for the project are based on meeting identified needs within the State of Georgia and are consistent with the optimum use of the water resource development. Both recreation and flood control benefits are based on identified needs for both short and longtime frames. The project might not be justified as a single-purpose project for either recreation or flood control, but with the other authorized purposes it is a viable project.

ARCHEOLOGICAL SURVEY AND SALVAGE ACTIVITIES

In regard to archeological survey and salvage activities, project implementation would promote these activities. This is beneficial in that emphasis will be placed on studying the area which has received little attention in the past. Of course, the sites that are inundated or destroyed will be lost to future study and this is an adverse impact. If preservation measures are not taken, archeological sites will be subject to attrition from the activities of man. The National Park Service has initiated a contract with Dr. Lewis Larson, State archeologist, to locate and evaluate archeological sites which may be affected by the proposed project.

The Georgia State Outdoor Recreation Plan, 1972 shows a demand not met by existing supply in the Flint River area for both stream and lake-related recreational activities. The earliest the Spewrell Bluff project would be operational would be 1984. An analysis of the recreational needs for the project area, with allowances for future developments at competing projects, show a future need that is in excess of what the Spewrell Bluff project could supply.

Trotters Shoals Lake, Ga. and S.C.

OPPOSITION

Senator Bible. Colonel Irving, opposition testimony to the Trotters Shoals project was given on behalf of the Environmental Policy Center stating that, "It is not a desirable expenditure of taxpayers' funds to place an enormous lake right between two already existing enormous lakes on the Savannah River." Would you comment?

Colonel Irving. Yes, sir. The Trotters Shoals project is an integral unit of the plan for development of the Savannah River Basin for power, recreation, flood control, and allied purposes. This project is both economically and financially sound, based on benefits and power revenue, respectively. The power output will be absorbed by the system as soon as available and this additional power is essential to meet the ever-growing demands. Likewise, recreation aspects of this project are geared to meet the increasing demands of the public.

In summary, Trotters Shoals is essential to complement the two existing projects and complete the three-project Savannah River system.

Kaneohe-Kailua Area, Hawaii

Senator Bible. The budget request was $150,000. The House has included $197,000. What is your capability on this project?

General Morris. Our capability on this project is $197,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $47,000?

General Morris. The additional amount would be used to complete preconstruction planning, sir.

Lahaina Harbor, Hawaii

Senator Bible. There is nothing in the budget. Local interests have requested $250,000. What is your capability on this project?

General Morris. Mr. Chairman, local interests will not be ready to fulfill their requirements in fiscal year 1974 and consequently we have no capability for initiation of construction.

Cottonwood Creek Dam, Idaho

Senator Bible. There is nothing in the budget, and local interests have requested $270,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $270,000 to initiate construction.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Cottonwood Creek Dam, Idaho

Summarized Financial Data:

Estimated Federal Cost		$3,230,000
Estimated non-Federal Cost		621,000
Cash Contributions	0	
Other Costs	$621,000	
Total Estimated Project Cost		$3,851,000
Allocations to Date		183,000
Balance to Complete		$3,047,000
Amount that could be utilized in Fiscal Year 1974		$ 270,000

Authorization: Flood Control Act of 1966

Location and Description: The project will be located on Cottonwood Creek at the north city limits of the city of Boise, in Ada County, Idaho. The project would consist of an earthfill dam 117 feet high with uncontrolled spillway and outlet works that would create a reservoir of 2,480 acre-feet of capacity. The reservoir would provide 410 acre-feet storage for sediment and 2,070 acre-feet storage for flood control.

Proposed Operations: The amount of $270,000 could be used to initiate construction of the project.

Justification: Floods at Boise, Idaho, result from local summer thunderstorms having high intensity precipitation over mountainous watersheds adjacent to the city. The proposed improvement would provide flood protection to an urban area within the city of Boise from floods originating within the Cottonwood Creek drainage basin. The flood of record on Cottonwood Creek occurred on 20 August 1959 and inundated an area of 160 acres. A recurrence of this flood under present prices and conditions would cause damages of about $508,000 all of which could be prevented by the project. Estimated annual benefits are $170,000 all accruing from flood control. The benefit-to-cost ratio is 1.2 to 1, based on 100-year project life.

Ririe Lake, Idaho

Senator Bible. The budget request was $7,200,000. The House has included $7,200,000, and local interests have requested $9 million. What is your capability on this project?

General Morris. Our capability on this project is $7,200,000, the same as the budget, Mr. Chairman.

Cross Wabash Valley Waterway Including Wabash River, Ohio River, to Mount Carmel, Ill. and Ind.

opposition

Senator Bible. Mr. Thomas E. Dustin, executive secretary of the Indiana Division of the Izaak Walton League, has again submitted a statement of opposition to the Cross Wabash Waterway. Mr. Jim Jontz, executive director of the Indiana Conservation Council, and Mary Emlen, member of the Indiana Advisory Committee to the National Audubon Society, have also submitted statements of opposition to the navigation study. This opposition criticized the economics of the segment to Mount Carmel, stated that the reduction of 53 miles of free-flowing river would result in unacceptable environmental destruction, and objected that the beneficiaries would not make any payments toward construction, maintenance, and operation of the waterway. What is your response to these statements?

Colonel Eineigl. The reconnaissance study for the Cross Wabash Valley Waterway, from the Ohio River to the Great Lakes, indicated that costs of a through waterway would far exceed the saving from navigation, except possibly on the Wabash River below Mount Carmel, Ill. Our continuing survey scope study of the Mount Carmel segment is not sufficiently complete to properly weigh the prospective benefits and costs until more detailed market and transportation data is obtained and analyzed. If the Mount Carmel segment appears economically feasible, then the studies would continue and the impact on the environment will be determined and carefully considered. At present there is no legislation providing for user charges on the inland waterways; however, the National Water Commission Report, that is now under consideration, includes proposed recommendations for such charges.

East St. Louis and Vicinity—Interior Flood Control, Ill.

Senator Bible. The budget request was $600,000. The House committee has allowed $1,200,000 and local interests have requested $1,500,000. What is your capability on this project?

General Morris. Our capability on this project is $1,500,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $900,000?

General Morris. The additional amount would be used to complete planning and to initiate construction.

HARRISONVILLE AND IVY LANDING DRAINAGE AND LEVEE DISTRICT NO. 2, ILL.

Senator BIBLE. There is nothing in the budget and local interests have requested $150,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $150,000 to initiate construction.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Harrisonville and Ivy Landing Drainage and Levee District No. 2, Illinois

Summarized Financial Data:

Estimated Federal Cost		$2,800,000
Estimated Non-Federal Cost		9,900
Cash Contribution	$ 0	
Other	9,900	
Total Estimated Project Cost		$2,809,900
Allocations to Date		105,000
Balance to Complete		2,695,000
Amount that could be utilized in FY 1974		150,000

Authorization: 1962 Flood Control Act

Location and Description: The project is located on the left bank of the Mississippi River between miles 141 and 156 above the Ohio River in Monroe County, Illinois. The proposed plan of improvement provides for the construction of two pumping stations and appurtenant facilities.

Proposed Operations: The amount of $150,000 would be used to initiate construction.

Justification: Although the area is presently protected from major floods on the Mississippi River, substantial damages result from interior flooding due to interior runoff impoundment during high Mississippi River stages. The proposed plan for construction of two pumping stations is needed in order to alleviate damage to crops and property. The benefit-to-cost ratio is 1.3 to 1. Average annual benefits, all flood control, are estimated to be $197,000.

Kaskaskia River, Ill.

Senator Bible. The budget request was $8,700,000. The House committee has allowed $8,700,000 and local interests have requested $9,000,000. What is your capability on this project?

General Morris. Our capability on this project is $9,000,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $300,000?

General Morris. The additional amount would be used to advance construction of canal revetment at the remaining reaches.

OPPOSITION

Senator Bible. Mr. Blackwelder contends that it is not a justifiable use of taxpayer funds to spend money on the Kaskaskia River Canal, Ill., which is primarily benefiting certain narrow economic interests.

Colonel Edgar. Mr. Chairman, studies have indicated that there are adequate reserves of minable coal which are of such quality that they could compete with other fields in the region if a waterway were available for transportation. The State of Illinois, through its Governor, local industries, residents, representatives of official agencies concerned with the unemployment problem, and the Kaskaskia Valley Industrial Cooperation have endorsed the project in the expectation that it will enhance the economic potential of this section of Illinois. The mineable reserves of approximately 1,810,000,000 tons of low-sulfur-content coal can economically compete with coal presently mined from other sources and shipped to industrial areas on the Upper Mississippi, Illinois, and Lower Mississippi Rivers. This coal can and will be utilized to meet the critical need for our expanding energy requirements. It is anticipated that shippers of grain and existing or new industries in the project area will utilize the navigation project when it becomes operational. Interest has been expressed by a large granary as to the dates of availability of navigation. In addition, interest has been expressed by large metal refining industries indicating their potential development and utilization upon project completion.

Lincoln Lake, Ill.

OPPOSITION

Senator Bible. Mr. Merle A. Buddemeier, president, Douglas County Illinois Farm Bureau, has testified that little work has been done on solving the drainage problem. The Corps testified last year on plans underway for arriving at a solution. What progress has been made?

Colonel Eineigl. The farm drainage problem in Douglas County has been addressed in some detail, and both the Corps and elements of the State government are satisfied that solutions are at hand. The solution involves replacing drainage outlets, usually with larger pipe, to assure that they will convey the same quantity of water, after the project is built, as they presently convey. Locating the tile outlets has been

difficult because no one knows where they are. Oftentimes the discharge end has been silted over, making them operate at a low efficiency. It was concluded that the best way of proving the efficiency of our solution was to select a pilot area and install a portion of the improved system. An attempt was made to have the Douglas County Soil and Water Conservation District select the area for the pilot project. They declined to do so. Then the State of Illinois and the corps, in concert, selected an area known as Sargent No. 3. This was to be a cooperative project between the State and the corps. However, on May 8, 1972, the State was essentially enjoined from cooperation and coordination with the corps on almost all aspects of the Lincoln project. This injunction was in effect until it was dissolved on February 14, 1973. Meanwhile, a new administration was installed in the State of Illinois which began to reexamine the position of the State on the Lincoln project.

The State has asked the corps to study, along with the State additional alternative plans for the overall project. Therefore, it was decided to halt the pilot drainage project. Accordingly, because of this situation, a pilot program to demonstrate the efficiency of our solutions has not been effected, although considerable work has been accomplished.

ECONOMIC FEASIBILITY OF DRAINAGE PROBLEM

Senator BIBLE. Mr. Buddemeier contends that there is no economically feasible solution for a drainage problem which extends over 195,000 acres.

Colonel EINEIGL. It is erroneously alleged that some 195,000 acres in Douglas County would be adversely affected by the Lincoln project as presently formulated. A great portion of this 195,000 acres lies at a sufficiently high elevation such as to preclude any effect by Lincoln Lake. Some 40,000 acres might be affected if remedial drainage work were not undertaken. With the contemplated remedial work, not only would Lincoln lake as presently conceived be very effective in reducing flood damages along the lower Embarras River and contribute, as part of a system of lakes, to the reduction of flood damages along the Lower Wabash River, the Ohio River and even some small beneficial effects on the Mississippi River, but would effect some incidental drainage benefits in Douglas County.

Senator BIBLE. Mr. Buddemeier again questions the ability of Lincoln Reservoir to control flooding, and suggested alternative measures. What are your comments?

Colonel EINEIGL. The project will not remove all risks of flooding, however, an indication of the project's efficiency on the Embarras may be derived from the fact that over 75 percent of the present average annual damages would be eliminated by the project. Alternative methods for accomplishing project objectives include: no development; various damsite locations; various levels of development of the damsite; a series of upstream reservoirs; channel improvements and levees; and the nonstructural alternatives of zoning, evacuation, and flood forecasting. None of those alternatives studied would provide the benefits that would be provided by the Lincoln project, commensurate with desirable levels of social, environmental and downstream impacts.

EUTROPHICATION PROBLEMS

Senator BIBLE. Mr. Brent Blackwelder of the Environmental Policy Center contended that serious eutrophication problems are likely to occur if a reservoir is built on the Embarras River. What is your comment?

Colonel EINEIGL. The question of eutrophication was covered in last year's testimony. Briefly, State and Federal laws dealing with water pollution are expected to provide a satisfactory quality of water in the lake. It is anticipated that Charleston and Mattoon will be required to use advance waste treatment methods to meet water quality standards. Also, existing and proposed land treatment plans, which tend to reduce soil erosion, are believed to be the best way to reduce nutrient loading of streams from agricultural sources.

Senator BIBLE. If, as testified, abundant supplies of ground water are available for local use, why should the Federal Government provide the source of water for Charleston?

Colonel EINEIGL. The matter of ground water has been considered, with the conclusion that the use of surface water is the most efficient and dependable long-term approach. The preponderance of drain tiles above the Lincoln Lake area tends to reduce somewhat the ground water recharge capability, and extensive use of the ground water could have adverse effects on the productive capability of the area. In the case of Charleston, as in all such cases, all costs allocated to the water supply purpose is a non-Federal cost, in accord with the provisions of title III of Public Law 85–500, the Water Supply Act of 1958. Thus, the Federal Government will not provide a water supply to Charleston. Charleston would pay their fair share for what they get. There are a number of alternatives for meeting the needs—flood control, water supply, recreation—for each project purpose included in the Lincoln project. If we are concerned with only one of these objectives, it is unlikely that Lincoln would be the best way of accomplishing a single objective. However, when the several objectives are considered in combination, then Lincoln appears to be the most feasible means of efficiently accomplishing the several objectives.

Senator BIBLE. Would not the project have an adverse effect on the economy of Douglas County?

Colonel EINEIGL. There is no evidence that concludes that the economic impact of the project on Douglas County would be very adverse. Some impacts would obtain both adverse and beneficial. On balance, the net economic impact on Douglas County would not be significant. Experience has shown that, over time, the economic effects on an area, because of such a project, are beneficial.

ENVIRONMENTAL IMPACT STATEMENT

Senator BIBLE. What is the status of the environmental impact statement?

Colonel EINEIGL. A draft environmental impact statement was filed with the Council on Environmental Quality on May 8, 1971. The final statement was essentially complete but, because of the upcoming joint State of Illinois and corps study of additional alternatives, the completion of the final EIS will be deferred until completion of the joint study.

LOCK AND DAM NO. 26, MISSISSIPPI RIVER, ALTON, ILL. AND MO.

Senator BIBLE. The budget request was $746,000? The House committee has allowed $1,400,000 and local interests have requested $3,200,000. What is your capability on this project?

General MORRIS. Our capability on this project is $3,200,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $2,454,000?

General MORRIS. The additional amount would be used to complete planning and initiate construction.

OPPOSITION

Senator BIBLE. Mr. Blackwelder contends that lock and dam 26—Illinois and Missouri—is not a mere replacement of existing lock and dam 26, but an entire new project which would pave the way for a 12-foot channel in the Upper Mississippi and Illinois Rivers, thus requiring new authorization by the Public Works Committee. Under the guise of replacement, the corps may be committing the Congress and the taxpayer to multibillion dollars expenditures on new navigation projects.

Colonel EDGAR. This project is for replacement of an existing navigation structure that is in a deteriorated condition and has already reached its practical locking capacity. It is a crucial part of the inland waterway navigation system of the Nation. This structure is being designed to operate at maximum efficiency in order that the projected increase in traffic over the 50-year life of the project can be handled without major structural changes. Measures which improve the efficiency include separation of locks for simultaneous usage and lower locks sills to provide tows an easier entrance into the lock. During winter operation, lower lock sills will also protect the sills from damage by ice floes frozen to the bottom of barges. A study—Mississippi River, 12-foot channel, Illinois, Iowa, Missouri, Minnesota, and Wisconsin—is currently underway to consider the economic feasibility of providing a 12-foot channel in the Upper Mississippi and Illinois Rivers. This study will include data developed for the lock and dam 26 project, but will be evaluated on its own merits. If determined to be feasible, the results of the study will be presented to Congress for necessary authorization. However, construction of this replacement lock and dam will not commit the corps or Congress to any future construction other than replacement of this structure.

LOCK AND DAM 53 (TEMPORARY LOCK), ILL. AND KY.

Senator BIBLE. There is nothing in the budget, the House committee has allowed $1 million, and local interests have requested $1 million. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $1 million to initiate construction of the temporary lock.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Lock and Dam 53 (Temporary Lock), Illinois and Kentucky

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)	$17,800,000	
Estimated non-Federal Cost	0	
Total Estimated Project Cost	17,800,000	
Allocations to date	750,000	1/
Balance to Complete (Corps of Engineers)	17,050,000	
Amount that could be used in FY 1974	1,000,000	

1/ $650,000 to be apportioned in FY 1974.

Authorization: 1909 River and Harbor Act.

Location and Description: The proposed project is located on the Ohio River at Olmstead, Illinois, in the proposed Mound City Locks and Dam pool, 19 miles from the junction with the Mississippi River. The project is a temporary 110' x 1200' lock to supplement the existing 110' x 600' lock at Dam 53.

Proposed Operations: The amount of $1,000,000 would be used to initiate construction of the temporary lock at Lock and Dam 53.

Justification: The project, which can be completed in two or three construction seasons, will supplement the existing Lock and Dam 53. The Temporary Lock is expected to alleviate the serious congestion and costly delays to traffic during the interim, pending completion of Mound City Locks and Dam or a suitable alternative. The existing structure was completed in 1929 and the physical condition together with obsolete design, results in high maintenance and operation costs and in inefficient handling of traffic. Traffic on the Ohio River has been increasing at a very rapid rate since completion of the present system, and all indications are that traffic will continue to increase for many years. Due to the rapid industrial expansion now taking place along the Ohio River, the old structure is not capable of efficiently handling the modern type tows and the large volume of traffic now using the river. This demand upon the existing facility is rapidly accelerating its deterioration, and any breakdown will create intolerable conditions. The efficient and uninterrupted river traffic is highly important in normal times, and the importance is greatly increased in time of national emergencies. The benefit-cost ratio is 1.3 to 1. The total annual benefits of $3,215,000 are broken down as follows:

Navigation	$2,845,000
Area redevelopment	370,000
Total	$3,215,000

Mississippi River Between the Ohio and Missouri Rivers (Regulating Works), Ill. and Mo.

Senator Bible. The budget request was $2,600,000. The House committee has allowed $3,500,000 and local interests have requested $4,600,000. What is your capability on this project?

General Morris. Our capability on this project is $4,600,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $2 million?

General Morris. The additional amount would be used to advance dike and revetment construction.

William L. Springer Lake, Ill. (Formerly Oakley Lake)

Senator Bible. The budget request was $1,500,000. The House committee has allowed $1,500,000 and local interests have requested $2 million. What is your capability on this project?

General Morris. Our capability on this project is $2 million, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $500,000?

General Morris. The additional amount would be used to advance detailed project design, real estate acquisition, and to initiate construction.

OPPOSITION

Senator Bible. This committee has received opposition testimony from representatives of the Committee on Allerton Park, Environmental Policy Center, and the National Wildlife Federation. These groups opposed the project or some aspect of the project in previous years and their testimony is covered in the congressional records. In this year's testimony, the Committee on Allerton Park contends that the Corps is again trying to modify the project. If so, please say how and why. If not, is the project plan still the same as covered in the testimony of prior years?

Colonel Eineigl. The project plan this year is substantially the same as the approved plan of the prior years. What the Committee on Allerton Park considers a project modification is a misunderstanding also raised in several newspaper articles. This is in connection with the planned recreation in the green belt. Despite reports to the contrary, neither the Chicago district nor its recreational consultants have ever recommended any changes with respect to green belt recreation. Remarks attributed to Colonel Wells have no basis whatsoever in fact. The green belt development plan is almost identical to the concept first suggested by the State of Illinois.

POOR QUALITY WATER

Senator Bible. The Committee on Allerton Park, in their testimony, refer to two reports stating that the water in Springer Lake will be of poor quality. Is the Corps familiar with these reports? If so, do you have anything to say on the matter?

Colonel EINEIGL. The Corps is familiar with the various reports concerned with the effect of the Springer project on the Sangamon River water quality. This includes the report by the Illinois Environmental Protection Agency, the summary of which was introduced into committee testimony. The Corps accepts this report as generally being a fair and accurate appraisal of the project's impact with respect to water quality. Unfortunately, the summary itself may be misinterpreted when not reviewed within the context of the total report and an overall environmental perspective. A copy of the entire report is available should the committee desire a copy. The report makes the following significant points: 1. Water in the Springer and Friends Creek impoundments will generally meet most State of Illinois quality standards although certain aspects of its water quality may at times be unacceptable. 2. Friends Creek subimpoundment can be expected to have a better overall water quality than Springer. 3. Surface runoff and subsurface drainage from agricultural lands in the watershed tributary to the proposed reservoirs will be the major sources of nutrients and sediments in the Sangamon River System. These sources are difficult to control and may tend to impair water quality for some time. (Although the nutrient, phosphorus, will not be in its soluble form and, thus, not of significantly detrimental impact.) 4. Fecal coliform bacteria and phosphorus (soluble) are perhaps the two parameters most likely to have a significant adverse impact on water quality but municipal point sources, for instance sewage treatment plants, are currently major contributors to this problem and these are controllable and required to be controlled by State law. And finally, 5. Incidental project benefits of water quality improvement. Water quality improvements and benefits in Lake Decatur and the Sangamon River downstream could be offset by adverse developmental or management practices unless these aspects are given full consideration during the advanced planning stages of the project which they can, are, and will be given.

Therefore, the major item of concern to the Corps at this time concerns the impact of the channel modifications proposed for the green belt. These, in the opinion of the Illinois EPA, may result in a lower net water quality in the river below Lake Decatur. However, in the opinion of Corps planners, this would appear to be an overstatement based on the very limited modifications actually associated with the project.

BAN ON RECREATIONAL USE

Senator BIBLE. Is it true the Scruggs and Hammond report which is being prepared for the Corps, states that swimming will not be allowed in the Springer Lake until upstream sewage plants are improved and use of fertilizers controlled? Also, what about motor boating? Is this going to be banned because the lake will be too shallow?

Colonel EINEIGL. The initial report recommendations of the recreational consulting firm of Scruggs & Hammond did in fact include a statement which indicated that at the present time, and until certain remedies are implemented, that it is questionable as to whether the quality of water in the Springer pool would permit swimming. Various site planning considerations and the availability of more suitable swimming sites on the Friends Creek subimpoundment were also factors in the recommendation to limit swimming to the Friends Creek subim-

poundment pool. Accordingly, the preliminary public use master plan has been developed on this basis. The recreational consultant has determined that a sufficient number of suitable beach sites are available on the Friends Creek subimpoundment to meet present and predicted future needs for this activity. It is also true that high-power motorboating will be restricted in the project development. This is due in part to the shallowness of the Springer pool. However, the decision of the consultant to restrict boating to no-wake and low-power boating was primarily due to the erodable character of portion of the Springer pool shoreline and the desire to minimize conflict with alternative recreational activities such as fishing and sailboating. In this manner, visitor enjoyment is maximized and project resources are best protected. We should also note that State law requires the improvement in sewage treatment.

PREPARATION OF ENVIRONMENTAL IMPACT STATEMENT

Senator BIBLE. In last year's recall hearings you stated that a new environmental impact statement is being prepared. Has this EIS been completed? If not, will the subject on control of fertilizer and the impact on the farmers in that area be covered in the EIS?

Colonel EINEIGL. Work on a revised, updated EIS is near completion. Appropriate discussion on the subject of fertilizer controls is being incorporated into the new EIS. It should be noted at this time, however, that it is premature to assume that, because of very occasional high nitrate concentrations in the water to be impounded, upstream contro's on agricultural producers to reduce nitrate runoff from cultivated watershed will be required. Upon completion, the Springer project would not be the only water supply reservoir in the Sangamon River. Furthermore, rather than having an adverse impact, the Illinois Environmental Protection Agency has forecast that the Springer impoundment will cause an "averaging" of the nitrate concentrations from land-based sources. This will dilute the maximum concentration with subsequent benefits to both the stream ecosystem and water users. Any pollution control program in this particular area, should it ever become necessary or desirable, would essentially be a statewide solution to a statewide problem. Most agricultural experts are now predicting that different types, rates, and timing of fertilizer applications can be expected to reduce this problem markedly so as to meet water quality standards and retain current agricultural yields. The EIS draft should be ready for coordination during July 1973.

SPRINGER LAKE/DECATUR PROJECT

Senator BIBLE. We have repeatedly heard that the Springer Lake project is clearly a Decatur project. Can you comment on this?

Colonel EINEIGL. Springer Lake is not strictly a Decatur project. The many benefits provided by this project, including water supply benefits which are of particular importance to the city of Decatur, are widespread and available to most regional entities and the general public. The secondary benefits from the use of water at Decatur would be of considerable value to the entire State.

OPERATIONAL OR DESIGN ERRORS

Senator BIBLE. The Committee on Allerton Park and the Environmental Policy Center raised some fears that an operational or design error will destroy the bottomlands of Allerton Park. As an example they cited three Corps projects in Illinois which had some major design flaw. Can this also happen in connection with the Springer Lake project?

Colonel EINEIGL. Artificial and man-controlled water levels will not present a constant threat to University of Illinois Allerton Park through management misjudgment as claimed by a few remaining Allerton interests. The Corps of Engineers and the Illinois Division of Water Resource Management have worked closely with the University of Illinois and their consultants, the Harza Engineer Co., and others. Each of these parties has confirmed the hydrologic analysis procedures used by the Corps of Engineers to determine the depth and duration of flooding in Allerton Park attributable to the Springer project. Inclusion of double forecasting, by which it is meant that the regular operating procedure shall include current and projected stages and discharge for both the natural and regulated conditions will help provide reasonable assurance that modified flooding will not exceed the conditions which have been agreed upon.

Senator BIBLE. Governor Walker, when endorsing this project, imposed certain conditions. Can you comment on these?

Colonel EINEIGL. By letter dated June 7, 1973, Governor Walker requested that the Corps of Engineers not resume land acquisition for the Springer Lake project pending resolution of two of the five points raised at a press conference at Decatur, Ill., on May 10, 1973. These two points are Nos. 4 and 5 of the Governor's news release and are the following:

> Assurances from the Corps of Engineers that the project will not result in significantly increased flooding of Allerton Park, where flooding periodically occurs now, or adversely affect the ecology of that park.
>
> Assurances from the Army Corps of Engineers that the land above the joint-use pool for accommodation of the flood control pool (approximately 9,655 acres) will be covered with foliage and will generally be satisfactory for recreational use when not covered with water.

The district engineer, Chicago district, in response to this request, furnished Governor Walker, on June 15, 1973, information indicating that Springer Lake will not cause significant increases in the flooding of Allerton Park.

He also furnished the Governor information showing that the vegetation in the area between the conservation pool and the flood control pool will be satisfactory for recreational uses. Since this exchange of correspondence is quite recent, no reply from Governor Walker has been received. When the Governor's letter arrived in the Chicago district, negotiation for acquisition of several properties were almost completed. These negotiations are continuing up to the point of signing the agreements. As of this moment, actual purchase of certain tracts is being held in abeyance so that the Governor has time to consider and reply to the recently furnished informations.

Senator BIBLE. The Committee on Allerton Park contends that the Corps has not answered questions raised by Senator Stevenson in last year's testimony. What questions are these?

Colonel EINEIGL. Sir, in his testimony of last year, Senator Stevenson stated that important questions have to be resolved. He cited dam operating procedures, ground saturation rates, amount of land to be taken in the greenbelt and coordinated release rates for all impoundments on the Sangamon and Illinois Rivers. As stated by Senator Stevenson, these were all subjects of on-going studies. With respect to these studies, it has been our procedure to inform the Senator of the results of these studies immediately after completion. The questions on dam operating procedures, for example, were answered by our letter dated May 16, 1973. In this letter, the status of the other studies was also furnished Senator Stevenson with an estimated timetable for their completion.

LAND COSTS

Senator BIBLE. What about your land costs? Are they realistic?

Colonel EINEIGL. We believe that our land costs are realistic. The $450 per acre quoted by the Committee on Allerton Park is the average cost per acre shown in our 1970 report. This is an average value including streambed, wet low-lands, pasture, and to some extent, farmland, all based on the market value at that time. Not included in this value is the contingency factor normally used, or buildings and other improvements shown separately in our estimate of the 1970 report. The $1,000 per acre the Committee on Allerton Park quotes as land selling for is the current price (1973) for some of the land and would not be the average for the entire project.

Senator BIBLE. The National Wildlife Federation recommends continuation of a stipulation that project funds not be used to acquire Allerton Park land. Is there such a restriction?

Colonel EINEIGL. No sir. A temporary restriction had been imposed but was terminated 2 years ago. Such restriction was only in effect until the Appropriations and Public Works Committees of the Congress approved the modified project plans. This subject was covered in detail in last year's testimony.

DEVELOPMENTS AFFECTING DECISIONMAKING

Senator BIBLE. The Committee on Allerton Park refers to mounting opposition to the project as new and/or more complete information comes to light. Is this true? What, if any, genuinely new developments have affected project decisionmaking?

Colonel EINEIGL. There continues to be both strong support for and opposition to the project. The problem of resolving conflicting public needs and increasing public understanding of the project and its impact is still of widespread public interest. Although of course difficult to evaluate, there has been no visible indication of any genuine growing project opposition. To the contrary, recent support by the new Governor of the State of Illinois and other interested parties such as the Piatt County Board of Supervisors would seem to suggest that just the opposite is true. There are also indications that a large number of project opponents are still unaware of the project modification and continue to erroneously believe that this project will "destroy" Allerton Park, et cetera. Nevertheless, whatever the expressed causes of concern, there have been few, if any, "new developments." To be sure,

there has been a change in emphasis with respect to specific issues. However, the great majority of these have been previously responded to, and virtually all are addressed in the project's new environmental impact statement which is expected to be released for agency and public coordination this year.

Senator BIBLE. The environmental policy center has claimed that almost all of the benefits claimed for the project can be realized at a lesser cost by treating the upper Sangamon Watershed for erosion control, developing a greenbelt along the river, and using well water for the city of Decatur. How would you comment?

Colonel EINEIGL. All reasonable alternatives to completing the William L. Springer Lake project have been investigated. Environmental amenities and other intangibles have been considered in the decision-making. The informed judgments of an interdisciplinary team of environmental professionals were utilized during evaluations. Based on the results of these analyses, no alternative plan or combination of alternative plans, structural or nonstructural, were found which would fulfill the social, economic, and other requirements of present and future generations of Americans to the same extent as the present project plan.

DECLINE IN COST-BENEFIT RATIO

Senator BIBLE. The Committee on Allerton Park charges that this is a marginal project and that the benefit-cost ratio has declined from 1.15 to 1.06. Can you comment on this?

Colonel EINEIGL. These questions incorrectly assume that the benefit-cost ratio is less than 1. This is not the case, and accomplishment of the project in accordance with the current plan is economically justified by the reduced flooding, assured water supply, and increased recreational opportunity that will result for the people of central Illinois. The benefit-cost ratio has moved downward from the 1.15 level that existed at the time of the 1970 report. The cause of the decline has been the increase in cost of construction with a lesser increase in agricultural and other benefits. It should be noted that several of the benefits related to recreation and fish and wildlife were based on very conceptual planning. These benefits have not been recalculated during the past 3 years and are expected to provide an improved picture when they are recalculated based on a specific recreational plan of development this would be true whether or not the new schedule of recreational benefit values proposed by the Water Resource Councils are adopted, and more detailed design and cost estimates.

BIG BLUE LAKE, IND.

Senator BIBLE. There is nothing in the budget, and local interests have requested $50,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $50,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Big Blue Lake, Indiana

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$35,300,000
Estimated non-Federal Cost		7,865,000
Cash Contribution:	$7,865,000	
Water Supply	4,174,000	
Recreation	3,691,000	
Total Estimated Project Cost		43,165,000
Allocations to date		0
Balance to Complete (Corps of Engineers)		35,300,000
Amount that could be used in FY 1974		50,000

Authorization: 1968 Flood Control Act.

Location and Description: The proposed dam site is in east-central Indiana on the Big Blue River about 42.1 miles above its confluence with Sugar Creek to form Driftwood River, a tributary of East Fork White River. The site is in Hancock County about 3 miles north of Morristown and about 26 miles east of Indianapolis, Indiana. The project will consist of a rolled earth and concrete gravity type dam with a gate controlled overflow spillway and three gate controlled sluices in the base of the dam. The reservoir would have a storage capacity of 120,100 acre-feet.

Proposed Operations: The amount of $50,000 would be used to initiate preconstruction planning of the project in FY 1974.

Justification: Big Blue Reservoir will be operated as a unit of the general comprehensive plan for flood control and related water resource development in the Wabash River Basin. The project, in combination with the fifteen other presently authorized reservoirs in the Wabash Basin, will aid in the reduction of flood flows along the Wabash River and, to a lesser degree, along the Ohio River below the Wabash River. The 269-square-mile drainage area controlled by the reservoir is about 45 percent of the Big Blue Basin which is tributary, in turn, to Driftwood, East Fork White, White, and Wabash Rivers. The project would provide for reductions in flood stages and flood damages in overflow areas along about 42 miles of the Big Blue, 15 miles of the Driftwood, and 192 miles of the East Fork White Rivers below the proposed dam and, to a lesser extent, along downstream reaches of the White and Wabash Rivers. The total values of all urban developments along the reaches of the Big Blue and East Fork White Rivers below the proposed dam are estimated at $106,842,000 and $137,804,000 respectively (1972 values). Recurrence, under present conditions, of March 1913 record flood heights along affected reaches of the Big Blue, Driftwood and East Fork White Rivers would cause damages estimated at $13,885,000 (1972 values), of which $7,998,000 would be prevented by the project.

Operation of the project during flood conditions equivalent to those of March 1913 would reduce flood levels about 1.7 feet at Shelbyville, which is about 19.6 miles below the proposed dam, and 0.3 feet at Columbus, which is about 57.1 miles below the proposed dam. Other damaging floods during the last five years occurred in February 1971, January-February, March and April 1970, January-February and April 1969, February, May and August 1968. In addition, the project would provide storage for low-flow augmentation in the interest of water quality control, for water supply and for general and fish and wildlife recreational opportunities. The benefit-cost ratio is 1.7 to 1. The total annual benefits of $3,760,000 are broken down as follows:

Flood control	$1,966,000
Water supply	273,000
Water quality control	427,000
Recreation:	
General	1,005,000
Fish and Wildlife	89,000
Total	$3,760,000

Big Pine Lake, Ind.

CAPABILITY

Senator Bible. The budget request was $200,000. The House committee has allowed $50,000, and local interests have requested $200,000. What is your capability on this project?

General Morris. Our capability on this project is $50,000, Mr. Chairman.

Start of land acquisition has been delayed pending consummation of recreation cost-sharing contract and assurance agreements with the State of Indiana consistent with the requirements of section 221 of the 1970 Flood Control Act.

OPPOSITION

Senator Bible. This committee has again heard from a number of individuals and groups, testifying in opposition to the Big Pine Lake project. Among those testifying are: Penny Parmenter, the Committee on Big Pine Creek; Mr. A. A. Lindsey, Ph. D., of the department of biological sciences, Purdue University; Mr. Ned K. Bleur, of the Bloomington Canoe and Kayak Club, who also represented other canoe and kayak interests; Gail Ann Fisher, Friends of Big Pine Creek and Children Who Care About Big Pine Creek; Mary Enmler, Indiana Advisory Committee to the National Audubon Society; Mr. Jim Jontz, Indiana Conservation Council and the Illinois Wildlife Federation; Mr. Brent Blackwelder, Environmental Policy Center; Mr. Thomas E. Dustin, Indiana division of the Izaak Walton League of America; Mr. Joel M. Pickelner, National Wildlife Federation; and others. The opposition has raised questions on many different aspects of the project, and I wish to address the major issues as we proceed. First, several questions have been raised about the development of the benefit/cost ratio. How is the recreational potential of the existing Big Pine Creek included in the benefit/cost ratio? As a cost? How are future scientific and educational users reflected? How is the social cost for loss of science and natural areas taken into account?

Colonel Eineigl. The present policy for calculating the benefit-to-cost ratio provides for the computation of recreation benefits on a net basis, that is, the difference between what exists under preproject conditions and that which will exist with the project, in accord with supplement 1, Senate Document 97, "Evaluation Standards for Primary Outdoor Recreation Benefits." The recreational potential of the existing conditions are therefore not taken into account. The intangible effects of the project, such as future scientific and educational uses and loss of science and natural areas are considered in the effect assessment and are not included in the benefit/cost ratio. However, all known values, tangible and intangible, are considered in project formulation, either in the economic analysis or in the project effect assessment.

PROJECTED RECREATIONAL BENEFITS

Senator Bible. The Committee on Big Pine Creek and others expressed doubt about projected recreational benefits. Why not use the money to maintain and further develop fishing and hunting activities already present in the Creek?

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Colonel EINEIGL. The project was authorized to provide for flood control and recreation. Prevention of flood damage would be lost if the money was spent for recreation only. It should be noted that the recreation potential of the lake was evaluated, in cooperation with State and Federal agencies, considering existing facilities and potentials.

Senator BIBLE. Several individuals and groups have testified that the discount rate of 5½ percent should have been used instead of 3¼ percent. What discount rate was used and why?

Colonel EINEIGL. The interest rate used for project evaluation is 3¼ percent as established by the Water Resources Council regulations, in concert with the Secretary of the Treasury and other executive agencies. Also, Congress has considered and presented its views on the appropriate interest rates. In December 1968, the Water Resources Council implemented a regulation which raised the discount rate from 3¼ percent to 4⅝ percent for use in plan formulation and evaluation for the remainder of fiscal year 1969. However, an exception was made for projects which were authorized by Congress at that time. This exception would allow such projects to continue to be evaluated at the previous interest rate—3¼ percent—if an appropriate non-Federal agency provided, before December 31, 1969, satisfactory assurances to pay the required non-Federal share of project costs. Non-Federal assurances contained in chapter 100 of H. 13999, General Assembly of the State of Indiana, approved March 7, 1967, were considered to satisfactorily meet the requirements of the Water Resources Council regulation to qualify Big Pine Lake for the 3¼ percent interest rate.

FLOOD BENEFITS

Senator BIBLE. Many questions about flood benefits have been raised, Colonel, and I would now ask that you address several of these. For example, Mary Emlen of the Indiana advisory council to the National Audubon Society testified that whereas flood control is listed as the prime benefit of the project, flood damages are constantly increasing despite massive amounts of Federal money being used to alleviate flood damages. Would you comment on this issue?

Colonel EINEIGL. It is true that, in general, flood damages are constantly increasing. However, the flood damages would be considerably greater if it were not for the existing flood control works. The present and future damages can be reduced, or within given areas, practically eliminated through the provision of flood control works. Therefore, the concern of some that flood damage reduction projects should be discontinued because flood damages are increasing is not valid. What is needed is to continue the multiple pronged attack to reduce flood damages. Many means of reducing flood damages are recognized, including nonstructural, as well as structural, means. In considering these several means, the impacts on all segments of the public must be considered and not just one, or a limited number of segments. In addition, full evaluation of the benefits and cost must be made to the extent that available knowledge and legislation permits.

Senator BIBLE. Dr. A. A. Lindsey has testified that the corps' approach to flood control has been an absolute failure, a costly and ineffective overinsurance as shown by the recent Mississippi River floods.

Would you briefly comment on Mr. Lindsey's testimony, so that the record on Big Pine will be complete?

Colonel EINEIGL. Yes, sir. We have testified on the recent flooding in the Mississippi River Basin. The testimony was presented to the Senate Appropriations Subcommittee, on May 2, 1973, by Brig. Gen. Jarvis L. Kelly, Deputy Director of Civil Works, Office of the Chief of Engineers. Also, General Nobel presented testimony on June 25, 1973.

If one closely analyzes the spring floods on the Mississippi, it becomes clear that the Corps approach to flood control is working. While there were damages, the damages prevented by the Corps structures amounted to more than $7 billion, which was more than the cost of all protective works which have been constructed. Thus, in this one flood, and in a short time, the constructed works paid for themselves. The Corps of Engineers' approach is to reduce flood damages where feasible and by the most feasible means—either structural or nonstructural—involving many disciplines and requiring the cooperation of many institutions of local and Federal Government and the private sectors.

Senator BIBLE. Would you provide for the record the percentage of the flood-control benefits that are based on projected future development in the flood plain?

Colonel EINEIGL. About 45 percent. This represents primarily a change in the intensity of land use and value of crops rather than a change in the character of such uses.

OMITTED COSTS

Senator BIBLE. Eighty percent of the flood-control benefits are attributed to reduction of crop damage downstream while no costs are attributed to the permanent loss of production of 6,415 acres to be taken for the reservoir. Why are these costs omitted?

Colonel EINEIGL. Eighty percent of the flood-control benefits are to agricultural properties, including land, improvements, equipment, and crops. The majority of these benefits are to reduce crop damages. Costs of acquiring all lands required for the project are included in the cost estimate at their current; estimated fair market value. Additionally, an annual charge for "loss of land productivity" is included in the cost account which represents the net difference in land productivity using the private interest rate, and the Federal interest rate.

Senator BIBLE. Will not the project induce a false sense of security, thereby encouraging additional development of the lower reaches?

Colonel EINEIGL. Although flood-control structures do not eliminate all risks of flooding, significant reductions in risks are obtained, as shown by the recent Mississippi River floods. However, full disclosure in made of the reduced flood hazards, and the use to which this information is put determines the extent of false security created. For the development of the lower reaches of the Big Pine Creek, it should be noted that flood-control benefits, other than agricultural, include reduced damages to urban properties and transportation and utility facilities throughout the downstream flood plain. Flood reductions along the Wabash River resulting from project construction will not be of the magnitude required for a significant change in land use. Very

little new types of development should result from project construction.

Senator BIBLE. We have received testimony that indicates that an inequity exists at Big Pine. That is, those who live on lands that must be taken must give up their lands for the benefits of those who live in the flood plain. Shouldn't the user pay for the dam? Would you comment, Colonel?

Colonel EINEIGL. Those people who live on high ground and are dislocated by the project are fairly compensated for their property. In theory the benefits for a project should be sufficient to compensate those who are giving up opportunities. This is the case at Big Pine. The people who live and farm in the lowlands do so because the stream valleys contain some of the most productive soil in the Nation, and it is in the national interest to optimize the use of their lands and to protect the current developments therein. Flood plain management programs seek to minimize developments, which are flood susceptible, from occupying the flood plain. The question of having the user pay for the dam would pose an impossible task of determining who the user would be. Because the total flood-control benefits to be derived are spread throughout the lower reaches of the basin and the resultant economic benefits of better use of the resources are shared nationwide, and because the recreational benefits will extend throughout the region, the problem of defining the user is resolved by adopting the policy of local and Federal cost sharing, as in the case for Big Pine.

LOSS OF TAX BASE

Senator BIBLE. Penny Paramenter has testified that Warren County will foot a good portion of the bill. The loss of 8,000 acres of taxable lands will make a big dent in the tax base of the county. Also, what effect will the reservoir have on this agriculture community? There are very few farms available in the county for the relocation of the affected families. These families will have to locate outside of Warren County. In a small community, 8,700 people, where family ties to the land in some cases go back as far as four generations, this would have a very disruptive effect. What will be done for the county and for the affected people?

Colonel EINEIGL. Although we cannot predict what will happen to the tax base in Warren County when Big Pine is built, judging from experience with similar projects, the tax base can be expected to suffer some tax losses after project construction for 3 or 4 years, after which project-induced development will bring about a recovery and extension of the tax base far beyond present projections without the project. Farmers and others who must relocate will be eligible for relocation assistance, reimbursement for relocation expense, and other benefits provided by law. Public Law 91-696, the Uniform Relocation and Real Estate Acquisition Policies Act of 1969, provides substantial added assistance to these families dislocated by Federal projects. The benefits are over and above the fair market value compensation that each affected part gets.

LOSS OF SOCIAL AND ENVIRONMENTAL CONDITIONS

Senator BIBLE. Colonel, we have had many deeply concerned groups and individuals appear before the committee, or send in statements, to express their opposition to the loss of social and environmental conditions, to be found along Big Pine Creek, when the project is completed. What is the Corps doing to offset the loss of scenery, free-flowing streams for canoeing and kayaking, wildlife, flora and fauna, camping, hiking, and wildlife watching in its many forms? Please be brief.

Colonel EINEIGL. Last year we testified on the subject briefly. Five miles of free-flowing streams will be connected to lake water with a resultant change on the ecosystem within the immediate area. Wildlife habitat will be provided, and lake fishing will replace stream fishing for the 5-mile reach. Recreational areas will provide for continued camping and hiking, and areas will be reserved that will be useful for wildlife watching. Studies are continuing to minimize the effect the project will have on the Fall Creek Gorge. I should point out that Big Pine was not formulated in isolation from the environmental resources of the entire basin. In the Wabash comprehensive study and resulting plan, full consideration was accorded to the need for and desirability of preserving free-flowing streams for canoeing and many other social environmental reasons. This resulted in an "environmental corridor" element in the plan which was arrived at in conjunction with the other plan elements—flood plain management element, land treatment element, and structural element. Big Pine's place in the plan was determined only after full consideration of many of the alternatives, and in consideration of many objectives. A comprehensive plan cannot be a collection of single objectives elements, but rather must reflect a coordinated collection of interrelated elements. Big Pine Creek is attractive—especially the Fall Creek area, but so are many other streams in the area, and very few storage sites exist which can accomplish the desirable results that would be obtained from construction of Big Pine Lake. The net effect of the construction of Big Pine Lake would be to provide benefits and opportunites to many more people than will lose them.

Senator BIBLE. Why not designate Pine Creek as a scenic river in the national scenic riverways program? We've received testimony recommending this as an alternative.

Colonel EINEIGL. Such consideration is the responsibility of the Department of the Interior. I might point out that designation of Big Pine Creek as a scenic stream with recreation potential was considered in the Wabash River comprehensive study and an environmental corridor was recommended to be established and maintained through, and in addition to, the authorized project.

ENVIRONMENTALLY UNSOUND PLANS

Senator BIBLE. Mr. Jim Jontz, on behalf of the Indiana Conservation Council, Inc., and the Illinois Wildlife Federation, has testified that the Regional Director of the Bureau of Sport Fisheries and Wild-

life of the Department of Interior has written to the Corps, stating that the site plans are "environmentally unsound." Is this true? What is the Corps doing about this?

Colonel EINEIGL. Such a statement was made in expressing concern about certain flora and geological features. The Director also stated in his letter that, in view of additional studies in reviews being made prior to submission of a final environmental impact statement, he would be willing to undertake a reassessment. The coverage of environmental matters referred to a preliminary draft environmental impact statement which in reality is a first working paper which was to serve as a basis for developing a quality environmental impact statement. Continued coordination is being maintained with the Bureau of Sport Fisheries and Wildlife, Department of the Interior, to determine if they have had a change of views regarding the project. Their views and input, as well as from other interested Federal and State agencies, are being considered and accommodated to the extent practicable in formulation of the project feature. Outside environmental consultants have been utilized to assure that any possible bias is eliminated from environmental consideration. It should be noted that all relevant alternatives including both structural and nonstructural means have been or are presently being considered for Big Pine to determine how efficiently they can meet the water-related needs of the area while at the same time considering the environmental and social effects. The practice of analyzing alternatives has been a long-established practice of the Corps of Engineers long before passage of the National Environmental Policy Act, and the act only formalized that substantive work, which we have been doing, as a matter of sound planning procedures.

Senator BIBLE. One last question, Colonel. Isn't the Corps premature in requesting funds for land acquisition before a firm site has been selected, an environmental impact statement prepared, and economic and engineering documents produced?

Colonel EINEIGL. Minor site adjustments are within the discretionary authority of the Corps. Such minor site adjustments as may be required in final project design are unlikely to have a significant effect on the benefit/cost ratio. The draft environmental impact statement is scheduled for submission to CEQ in September 1973. Land acquisition will not commence until a final impact statement is filed with CEQ during the second quarter of fiscal year 1974. The appropriation of funds for land acquisition is consistent with normal funding procedures. If the requirements which must be met prior to initiation of land acquisition are not met, then the funds appropriated for that purpose would not be utilized. However, we anticipate that the requirements can be met.

BIG WALNUT LAKE, IND.

Senator BIBLE. There is nothing in the budget, and local interests have requested $100,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $100,000 to continue preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Big Walnut Lake, Indiana

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)	$32,900,000
Estimated non-Federal Cost	19,716,000
Cash Contribution $19,716,000	
Total Estimated Project Cost	52,616,000
Allocations to date	110,000 1/
Balance to Complete (Corps of Engineers)	32,790,000
Amount that could be used in FY 1974	100,000

1/ $75,000 to be apportioned in FY 1974

Authorization: 1968 Flood Control Act.

Location and Description: The proposed dam site as recommended in the special report on alternatives accepted by the Congressional Committees on Appropriations on 17 October 1972 is located in west central Indiana and Big Walnut Creek, about 22.4 miles above this stream's junction with Mill Creek to form Eel River. This river is tributary, in turn, to the White and Wabash Rivers. This site, in Putnam County, is about 1 mile north of Greencastle, and about 35 miles west of Indianapolis, Indiana. The project will consist of a rolled earth and concrete gravity type dam with a gate controlled over flow spillway in the concrete section of the dam and gate controlled sluices in the base of the dam. The reservoir would have a storage capacity of 275,000 acre-feet.

Proposed Operations: The amount of $100,000 would be used to continue preconstruction planning of the project in FY 1974.

Justification: The Big Walnut Lake will be operated as a unit of the general comprehensive plan for flood control and related water resource developments in the Wabash River Basin. The 212 square mile drainage area controlled by the project is about 64 percent of the Big Walnut basin which is tributary, in turn, to the Eel, White and Wabash Rivers. The project would provide for reductions in flood stages and flood damages in overflow areas along about 22.4 miles of Big Walnut Creek, 50.8 miles of the Eel River, and 139.4 miles of the White River below the proposed dam and, to a lesser extent, along downstream reaches of the Wabash River. The total stream mileage benefited is about 310. The community of Reelsville is subject to partial inundation by floods on Big Walnut Creek, and Hazelton and Worthington are the largest of seven communities similarly subject to floods on the White River. No urban developments along the Eel River are subject to flooding. The total values of all urban development along Big Walnut Creek and the White River below the proposed dam, are estimated at $112,000 and $13,416,000, respectively, (1972 values). The maximum floods of record occurred on Big Walnut Creek in June 1957, on Eel River in January 1950, and on the White River in March 1913. The most damaging flood along reaches of these streams downstream from the proposed project was the March 1913 flood. Recurrence under present conditions of the March 1913 flood heights along affected reaches of Big Walnut Creek and Eel and White Rivers would cause damages estimated at $8,165,000, of which $409,000 would be prevented by the project (both 1972 values). Operation of the project during flood conditions equivalent to those of March 1913 would reduce flood levels about 0.8 feet at Reelsville, which

is about 18.3 miles below the proposed dam, by about 0.2 feet at Bowling Green (Eel River), which is about 35.1 miles below the dam site, and by about 0.3 feet at Newberry (White River), which is about 95.2 miles below the dam site. Damaging floods during the past five years have occurred in April 1972; January-February and April 1969; February, April and May 1968. In addition, the project would provide storage for low-flow augmentation in the interest of water quality control, for water supply, including possible inter-basin transfer to the vicinity of Indianapolis, and for general and fish and wildlife recreation. The project would also provide water and land for a proposed national fish hatchery immediately downstream. The benefit cost ratio is 2.1 to 1. The total annual benefits of $5,894,000 are broken down as follows:

Flood control	$2,336,000
Water Supply	989,000
Water Quality Control	69,000
Recreation:	
General	2,470,000
Fish and Wildlife	30,000
Total	$5,894,000

Brookville Lake, Ind.

Senator Bible. The budget request was $4,700,000. The House committee has allowed $4,700,000, and local interests have requested $5,700,000. What is your capability on this project?

General Morris. Our capability on this project is $5,700,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $1 million?

General Morris. The additional amount would be used to advance the recreation facilities by 9 months, however, there would be no advance of the overall project completion date.

Clifty Creek Lake, Ind.

OPPOSITION

Senator Bible. Mr. Thomas E. Dustin, executive secretary, Indiana division, Izaak Walton League, has testified that Clifty Creek is one of the finest natural streams in Indiana, and features a unique natural falls about 13 feet high. Mr. Blackwelder, of the Environmental Policy Center, also expressed concern about scenic stretches along Clifty Creek. Would you please comment?

Colonel Eineigl. Clifty Creek frequently runs dry in the summer, and in one instance remained dry for over 5 months. Such dry periods limit fishery development and other water uses, as well as increasing health hazards from natural stagnation. Low-flow augmentation from the reservoir should preclude long-term dry spells on the lower reaches.

Senator Bible. Mr. Dustin also expressed concern about the Indiana State study of scenic streams. What is the status of this study and will Clifty Creek be designated as a scenic stream by the State of Indiana?

Colonel Eineigl. The Indiana Department of Natural Resources, Division of Outdoor Recreation and Purdue University are currently determining criteria for scenic stream designation. At this time they are not actively collecting hard data on specific streams in Indiana for measurement against the criteria being developed.

INCREASING FLOOD DAMAGE

Senator Bible. Mary Emlen of the Indiana Advisory Committee to the National Audubon Society has testified that flood control is listed as the prime benefit for the project. Yet flood damages are constantly increasing, despite massive amounts of money being used to develop flood control projects. Would you please comment on this matter?

Colonel Eineigl. Flood control is one of three project purposes currently planned and comprise about 38 percent of the total benefits. Most of the flood-control benefits are to agricultural properties and crops. It is true that, in general, flood damages are constantly increasing. However, the flood damages would be considerably greater if it were not for the existing flood-control works. The present and future damages can be reduced, or within given areas, practically eliminated through the provision of flood-control works. Clifty Creek Lake

would reduce the average annual flood damages on Clifty Creek by about 90 percent and on East Fork White River by about 10 percent.

Senator BIBLE. Mary Emlen also expressed concern about the alternatives to the Clifty Creek project. What alternatives were addressed by the corps?

Colonel EINEIGL. The following alternatives were addressed by the corps for the Clifty Creek project. No development; various damsite locations; various levels of development of the damsite; levees; and the nonstructural alternatives of zoning, evacuation, and flood forecasting. All projects considered feasible were investigated and no viable alternative to the Clifty Creek project, which would meet the water related problems and needs of the area, was identified.

EVANSVILLE, IND.

Senator BIBLE. The budget request was $1,300,000. The House committee has allowed $1 million, and local interests have requested $1,300,000. What is your capability on this project?

General MORRIS. Our capability on this project is $1 million, Mr. Chairman. Award of the initial contract for the Pigeon Creek has been delayed several months due to lack of right-of-way. It now appears that the contract will be awarded this summer, resulting in a reduction in our capability from the budget amount of $1.3 to $1 million.

INDIANA SHORELINE EROSION, LAKE MICHIGAN SHORE EROSION, MICHIGAN CITY TO GARY, IND. (STUDY)

OPPOSITION

Senator BIBLE. Last year the Izaak Walton League raised a question about the National Park Service beach erosion study along the Indiana Dunes National Lakeshore. This year they asked about the status of the study. What was the outcome of the study?

Colonel EINEIGL. Last year we testified as to the relationship between the National Park Service study at the Indiana Dunes National Lakeshore and our Lake Michigan shoreline erosion studies, pointing out that the National Park Service study would provide information for a short-term solution for the Indiana Dunes National Lakeshore area whereas our studies would develop adequate long-term solutions for the dunes area, as well as the other reaches covered by the authorized study. The study recently prepared for the National Park Service by Leviton and Associates was reviewed by the Corps of Engineers at the request of the National Park Service. This professional review concluded that: the Leviton erosion hypothesis, which attributes shore erosion to the lake circulation system, is not valid; the corps' basic concepts of shore processes do not require modification as a result of the Leviton report; no evidence is presented to justify modification of the Michigan City Harbor navigation works in the manner recommended by Leviton; filling the naturally occurring breaches and saddles in offshore bars—proposed by Leviton—is not a practical plan for remedying shore erosion problems; and that contrary to Leviton's conclusion, rising lake levels is an important factor in shore erosion and bluff

recession. Although the Leviton study touches on a wide range of disciplines, it lacks quantification of the interrelationships of any of the physical parameters, including currents, winds, waves, physiographical features, erosion, deposition, and structures. The study is technically inadequate in that it does not support its hypotheses. Our review has been provided to the National Park Service, and a copy of the Corps' review is submitted for the records of the committee.

EROSION CONTROL STRUCTURES

Senator BIBLE. The Izaak Walton League has also testified that the Corps should not manage erosion studies because it has a conflict of interest since it originally participated in processes which resulted in structural interference with normal flows along Lake Michigan. What is the Corps role in permitting erosion control structures that cause erosion elsewhere on the shoreline?

Colonel EINEIGL. The U.S. Army Corps of Engineers does not advocate the building of erosion control structures as a panacea. There are some disadvantages to almost every attempt of man to control erosion; however, there are normally some significant advantages. In the case of some portions of the shore of Lake Michigan, there are in existence a large number of local protective works. There are also some unprotected areas. Some of the unprotected areas now require protection because of man's development of the shoreline in those areas, and because some of the nearby protective structures were poorly designed. These structures have intensified the natural erosion that is occurring now in the unprotected areas. To prevent recurrences of this problem, we have taken stringent measures to insure that negative impacts resulting from construction under the Federal permit program are minimized. Section 10 of the River and Harbor Act of March 3, 1899, 33 U.S.C. 403, prohibits the creation of an obstruction in navigable waters of the United States without the approval of the Secretary of the Army, acting through the Chief of Engineers. In administering this responsibility, we recognize that a property owner should not be prohibited from protecting his property from erosion.

However, we feel obligated to distinguish between proposed work which would directly protect one's property against natural forces by bulkheading or revetment, and work which would change natural drift or flow, such as construction of jetties and groins, resulting in damage to the property of others. On this basis, our policy provides that an applicant for a section 10 permit for work, such as construction of jetties or groins which we believe may alter natural conditions in such a way as to cause damage to another's property, is advised that his application cannot be processed until such time as he is able to provide proof that the proposed work would not substantially harm another's property. Such proof may be in the form of an engineering report from a qualified consultant. Accordingly, we feel that our policy should alleviate concern about permitting structures which may contribute to the erosion problems along the shores of Lake Michigan. Our permit program is continually updated to incorporate the latest findings in engineering and environmental disciplines. Research studies and reports concerning the overall relationships of coastal processes to erosion are accomplished by, and coordinated with, coastal engineers in government, industry, and various universities. These

studies are internationally recognized and accepted as producing the most accurate definition of coastal processes attainable within the current state of the science.

PATOKA LAKE, IND.

Senator BIBLE. The budget request was $2,200,000. The House committee has allowed $2,200,000, and local interests have requested $3,500,000. What is your capability on this project?

General MORRIS. Our capability on this project is $3,500,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $1,300,000?

General MORRIS. The additional amount would be used to advance completion of land acquisition by 6 months, however there would be no advance of the overall project completion date.

MISSOURI RIVER LEVEE SYSTEM, IOWA, KANS., MO., AND NEBR.

Senator BIBLE. There is nothing in the budget and local interests have requested $2,500,000. What is your capability on this project?

General MORRIS. Mr. Chairman, we have no capability on this project until the feasibility studies, now underway, are completed and approved.

MISSOURI RIVER, SIOUX CITY TO THE MOUTH, IOWA, KANS., MO., AND NEBR.

Senator BIBLE. The budget request was $1,650,000. The House committee has allowed $3 million, and local interests have requested $6 million. What is your capability on this project?

General MORRIS. Our capability on this project is $6 million, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $4,350,000?

General MORRIS. The additional amount would be used to advance the completion date of the project by 6 months to June 1978.

SAYLORVILLE LAKE, IOWA

Senator BIBLE. The budget request was $12,400,000. The House has included $12,400,000 and local interests have requested $13 million. What is your capability on this project?

General MORRIS. Our capability on this project is $13 million, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $600,000?

General MORRIS. The additional amount would be used to advance construction of recreation facilities.

BIG HILL LAKE, KANS.

Senator BIBLE. The budget request was $500,000. The House Committee has allowed $500,000 and local interests have requested $1,100,000. What is your capability on this project?

General MORRIS. Our capability on this project is $1,100,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $600,000?

General MORRIS. The additional amount would be used to advance completion of the project 1 year.

CEDAR POINT LAKE, KANS.

Senator BIBLE. Budgetary reserve will be available in fiscal year 1974, but there was no budget request. Local interests have requested $80,000. What is your capability on this project?

General MORRIS. Our capability on this project is $80,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $80,000?

General MORRIS. The additional amount would be used to advance completion of preconstruction planning 4 months.

CLINTON LAKE, KANS.

Senator BIBLE. The budget request was $7,200,000. The House committee has allowed $7,800,000, and local interests have requested $10,000,000. What is your capability on this project?

General MORRIS. Our capability on this project is $7,800,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $600,000?

General MORRIS. The additional amount would be used to acquire lands to reduce hardship cases and to advance completion by 3 months to September 1976.

DOUGLASS LAKE, KANS.

Senator BIBLE. There is nothing in the budget. Local interests have requested $100,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $100,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Douglass Lake, Kansas

Summarized Financial Data:

Estimated Total Appropriation Requirement		$ 31,300,000	
Future non-Federal Reimbursement		10,340,000	
Estimated Federal Cost (Ultimate)			$ 20,960,000
Estimated non-Federal Cost			10,340,000
Reimbursement:			
Water Supply	$ 9,860,000		
Recreation	480,000		
Other	0		
Total Estimated Project Cost			31,300,000
Allocations to Date			0
Balance to Complete			31,300,000
Amount that could be utilized in FY 1974			100,000

Authorization: 1965 Flood Control Act

Location and Description: The dam would be located in Butler County, Kansas, on Little Walnut Creek, about 6 miles northeast of Douglass, Kansas. The plan of improvement consists of a rolled-earth embankment and a controlled spillway. The dam would be 11,640 feet in length including the spillway, with a maximum height of 89 feet above the stream bed. The total reservoir storage would be 171,900 acre-feet, of which 76,400 acre-feet would be for flood control, 77,300 acre-feet, for water conservation and 18,200 acre-feet for sedimentation.

Proposed Operations: The amount of $100,000 would be used to initiate preconstruction planning.

Justification: The Douglass Lake is a unit in the plan for the control of floods in the Walnut River Basin. In the flood plain below El Dorado, Towanda, and Douglass Dam sites, there are about 6,900 residents and 2,400 employees. Floods average about 1 each year on the main stem and major tributaries. The maximum flood of record at the Winfield gage occurred in 1944 when the peak stage was 8.3 feet above flood stage, and 5.8 feet above flood stage at Douglass. Other major floods occurred in 1923, 1928, 1951, 1964, and 1965(2). Because of the nature of the overflow-land, even minor floods cover much of the flood plain along the main stem. Moderate floods cover almost all of it. Major floods pose extreme threats to the cities of El Dorado, Augusta, Winfield and smaller communities. Lands subject to flooding in the headwaters are primarily rural. Other properties subject to flooding within the system area include oil installations and related equipment, county roads, highways, railroads, and utilities. The estimated value of the properties, including proven and unproven minerals, is over $109 million. About 42,000 acres of rural land are in cultivation below the dams in this system, with an estimated crop value of $2 million. The average annual flood losses are estimated at $924,000. Construction of this project would provide a high degree of flood protection for 2,010 acres and would assist in the protection of 49,050 acres in the basin; develop a water yield of 14.2 MGD, and the optimum yield of the stream into a positive resource through storage and regulation; provide outdoor recreation for an estimated 485,000 persons annually; and sport fishing and hunting to help meet the regional demands. The benefit-to-cost ratio is 1.08 to 1. The average annual benefits for the project are broken down as follows:

Flood Control	$ 547,000
Water Supply	508,000
Recreation	334,000
Redevelopment	40,000
Total	1,424,000

EL DORADO, KANS.

Senator BIBLE. There is nothing in the budget, the House committee has allowed $50,000, and local interests have requested $50,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $50,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: El Dorado, Kansas

Summarized Financial Data:

Estimated Federal Cost		$ 2,010,000
Estimated non-Federal Cost		920,000
Cash Contribution	$ 0	
Other	920,000	
Total Estimated Project Cost		2,930,000
Allocations to Date		0
Balance to Complete		2,010,000
Amount that could be utilized in FY 1974		50,000

Authorization: 1965 Flood Control Act

Location and Description: The proposed project is located in Butler County, Kansas, on the West Branch of Walnut River. The plan of improvement consists of 1.6 miles of channel straightening and enlargement, and 21,700 feet of spoil bank and training levees. Alteration of highway, streets and utilities and the construction of a bridge would be required.

Proposed Operations: The amount of $50,000 would be used to initiate the preconstruction planning.

Justification: The El Dorado local protection project is a unit in the plan for the control of floods in the Walnut River Basin. This project, operating in conjunction with the authorized El Dorado Lake, would control the standard project flood and provide essentially complete protection for 140 acres of urban area in the city of El Dorado, Kansas. Floods average about one each year on the main stem and major tributaries of Walnut River. The maximum flood of record in May 1953 caused damages estimated to be $1,900,000 (1972 prices). The most recent flood was in April 1970, with damages estimated at $100,000. The properties subject to flooding are residential, commercial and industrial. The estimated value of the properties protected by this project is $18,560,000 (1972 prices). The flood problem at El Dorado is due principally to lack of protection works against flooding of the West Branch of Walnut River. The benefit-to-cost ratio is 1.6 to 1. The average annual benefits, all flood control, are estimated at $176,000.

FORT SCOTT LAKE, KANS.

Senator BIBLE. There is nothing in the budget, and local interests have requested $1 million. What is your capability on this project?

General MORRIS. Mr. Chairman, subject to a determination of the extent of need for water quality and streamflow regulation storage pursuant to Public Law 92-500, the capability on this project is $600,000 to initiate construction.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Fort Scott Lake, Kansas

Summarized Financial Data:

Estimated Total Appropriation Requirement		$ 31,400,000
Future non-Federal Reimbursement	$ 1,053,000	
Estimated Federal Cost (Ultimate)		$ 30,347,000
Estimated non-Federal Cost:		1,053,000
Reimbursement: Water Supply	$ 1,053,000	
Total Estimated Project Cost		$ 31,400,000
Allocations to Date		755,000
Balance to Complete		$ 30,645,000
Amount that could be used in FY 1974		$ 600,000

Authorization: Flood Control Act of 1954 (HD 549/81/2)

Location and Description: The project is located on the Marmaton River, about five miles west of Fort Scott, in Bourbon County, Kansas. The plan of improvement provides for construction of an earthfill dam about 75 feet high and 7,200 feet long to create a lake with a total storage capacity of 235,500 acre-feet.

Proposed Operations: Subject to a determination of the extent of need for water quality and stream flow regulation storage pursuant to PL 92-500, the capability on this project is $600,000 to initiate construction.

Justification: The Fort Scott Lake would control the runoff from 279 square miles of land in the Osage River Basin. The project would provide flood protection to about 37,500 acres along the Marmaton above the headwaters of Harry S. Truman Dam and Reservoir. Annual benefits will also accrue from recreation, fish and wildlife, water quality control and water supply. The benefit-to-cost ratio is 1.2 to 1.

The average annual benefits are listed below:
Current Estimate July 1972 Base (100-year life)

Flood Control	$ 785,000
Water Quality Control	203,000
Water Supply	118,000
Recreation	423,000
Fish and Wildlife	38,000
Area Redevelopment	219,000
TOTAL	$ 1,786,000

GARNETT LAKE, KANS. (DEFERRED FOR RESTUDY)

Senator BIBLE. There is nothing in the budget, and local interests have requested $20,000. What is your capability on this project?

General MORRIS. Mr. Chairman, the feasibility of this project is being restudied and the report of the district engineer has not been completed. In view of the status of the project, the Corps of Engineers does not have a capability for fiscal year 1974.

GROVE LAKE, KANS.

Senator BIBLE. The budget request was $227,000. The House committee has allowed $227,000, and local interests have requested $1 million. What is your capability on this project?

General MORRIS. Our capability on this project is $227,000, the same as the budget, Mr. Chairman.

HILLSDALE LAKE, KANS.

Senator BIBLE. The budget request was $1 million. The House committee has allowed $1 million, and local interests have requested $5 million. What is your capability on this project?

General MORRIS. Our capability on this project is $1 million, the same as the budget, Mr. Chairman.

OPPOSITION

Senator BIBLE. Dr. E. Raymond Hall appeared before this subcommittee in opposition to further appropriation toward the Hillsdale Lake, Kans., because he is convinced that the project is not economically justified and is no longer needed. He introduced into the record written statements of Mr. William Sherwood and Mr. Philip Knighton also in opposition to further appropriation toward Hillsdale Lake, Kans. Now that you have had an opportunity to review these statements, do you have any general comments?

Colonel MILLER. Yes, sir. As you are aware, Dr. E. Raymond Hall has appeared before this subcommittee several times in opposition to the Hillsdale Lake, Kans., project. Dr. Hall's statement is revised somewhat in form from previous statements. The thrust of his statement, however, is still to show that Hillsdale Lake is not economically justified and that the project is no longer needed. Information available to the Corps and estimates of costs and benefits show that Hillsdale Lake is well justified with a benefit-cost ratio of 1.6 to 1 and that needs are becoming more critical. I would be happy to answer any specific questions you may have at this time.

Senator BIBLE. What is the status of cost-sharing contracts?

Colonel MILLER. No cost-sharing contracts have yet been executed. However, all required contracts will be executed prior to initiation of construction.

Senator BIBLE. Dr. Hall and Mr. Knighton indicate that land costs range from $800 to $1,500 per acre. Do your cost estimates reflect these land values?

Colonel MILLER. No, sir. Based on July 1972, price levels, the average land cost for the project is estimated at $400 per acre. Today the average value may be near $600 per acre. No doubt there have been some tracts which have sold for as much as $800 to $1,500 per acre but these tracts are not representative of the bulk of the land needed for the project.

WATER SUPPLY STORAGE

Senator BIBLE. Several references have been made to a local water district which already has too much water. Is water supply storage still needed in Hillsdale Lake?

Colonel MILLER. Yes it is, sir. The need for a dependable source of water supply has been reaffirmed repeatedly by the local interests who have provided assurances. Johnson County Water District No. 2 is not included among these local interests.

Senator BIBLE. Dr. Hall and Mr. Knighton have testified that the Hillsdale Lake project will deprive the Marais des Cygnes Wildlife Refuge of necessary water supply at critical periods and that no provision has been made for replacing the water supply nor has the cost of doing so been included in the benefit-cost ratio. They suggest that these are violations of the National Environmental Policy Act and of the Fish and Wildlife Coordination Act. Dr. Hall also testified that the final environmental impact statement was defective because it lacked a response to a comment of the State water resources board concerning this wildlife area. Please comment.

Colonel MILLER. The wildlife refuge receives some water from surface runoff, but was designed and constructed to utilize flood waters to recharge the marshes. The system of upstream flood control projects would reduce flood frequency, thus increasing the potential for water shortage for the marshes of the Marais des Cygnes waterfowl area. This is discussed in some detail on page 6 of the Hillsdale Lake final environmental statement which was filed with the Council on Environmental Quality on February 2, 1972. Response to the comment of the Kansas Water Resources Board to which Dr. Hall has made reference is contained on page 19 of the final environmental impact statement. The total effect of the system of upstream lakes on the marshes will be closely monitored and any measures which may be necessary to alleviate a water shortage from reservoir operation will be developed in coordination with appropriate agencies. Because it is not known whether such measures will be necessary, no costs have been taken into account. If measures are determined to be necessary, their costs are expected to have negligible effect on the benefit-cost ratio. We are complying with both the National Environmental Policy Act and the Fish and Wildlife Coordination Act.

Senator BIBLE. Do you anticipate problems in the treatment of water supply storage for removal of pesticides and artificial fertilizers as suggested by Mr. Sherwood?

Colonel MILLER. No, sir. Removal of silt and treatment for hardness probably will be the two most important steps in converting the raw lake water into potable water.

Senator BIBLE. Have the effects of urbanization been taken into consideration in the design of sediment storage in the Hillsdale project?

Colonel MILLER. During construction of urban areas, sediment runoff is usually high. This can have a drastic effect on small lakes. Hillsdale Lake is large enough, however, to absorb the high rate of sedimentation due to construction in the watershed.

MUDFLATS

Senator BIBLE. It appears there will be extensive mudflats. Would you care to comment on this?

Colonel MILLER. Pool fluctuations in the normal operation of the project could be expected to create mudflats, particularly in the upper reaches of the lake. The extent of these mudflats should be minimal in the initial years of project operation. When full use of the water supply storage is made in later years, a 6-foot drawdown, which has a recurrence interval of 2 years, would create approximately 1,140 acres of mudflats.

Senator BIBLE. With an average depth of only 20 feet, isn't Hillsdale Lake rather shallow for recreational use?

Colonel MILLER. Not really, sir. Average depth is a rather abstract parameter of the recreational desirability of a lake project. Hillsdale Lake, a well as practically all manmade lakes, would be deepest at the embankment and shallow in the upstream reaches. During normal pool conditions, the depth of Hillsdale Lake would be 39 feet at the embankment. When flood waters are impounded, this depth may be as great as 53 feet. Nearby Pomona Lake, which was placed in operation in 1963, fluctuates from 29 feet deep at the dam during normal pool conditions to 58 feet deep during storage of floodwaters. Annual attendance at this project, which has nearly the same size multipurpose pool area, reached 1,256,000 in 1972.

Senator BIBLE. Mr. Knighton has suggested that the reservoir-levee system increased flood damage this year. Any comment?

Colonel MILLER. The existing reservoir-levee system in the Missouri River basin prevented much flood damage this spring. The fact that many of the lakes stored substantial amounts of floodwater indicated their effectivess. The federally constructed levees also prevented vast areas from being flooded. No federally constructed levee failed. Many non-Federal levees did fail, however, and flood damage was experienced.

FLOOD CONTROL ALTERNATIVES

Senator BIBLE. It is suggested that alternatives such as watershed management, smaller upland reservoirs, and protection of existing structures with flood plain insurance would better serve the flood control purpose. Were such alternatives investigated?

Colonel MILLER. Yes, sir. Watershed management and smaller upstream reservoirs can contribute to some extent in the control of flooding. However, because such reservoirs cannot be designed to control large volumes of runoff. they have little or no effect on major river flooding downstream. Flood plain insurance does not prevent flood damage.

Senator BIBLE. Were the effects of the loss of commercial sand considered?

Colonel MILLER. The Hillsdale Lake will not affect commercial deposits of sand because Big Bull Creek is not a source of such material.

The sediment load of this stream consists predominantly of clay with lesser amounts of silt.

Senator BIBLE. Please explain your estimate of economic loss on land.

Colonel MILLER. Economic loss on land, which is sometimes referred to as "additional economic losses," is an allowance for the higher rate of return generally considered necessary for agricultural land as opposed to water resource projects. Total economic loss on land is computed at 5 percent of the market value of the land. The project interest rate is 3¼ percent. Therefore, additional economic losses were computed at 1¾ percent, 5 percent less 3¼ percent, of the market value of land.

Senator BIBLE. Mr. Knighton has testified that different interest rates were used in computing benefits and costs for the Hillsdale Lake project. Is this standard practice?

Colonel MILLER. A discount rate of 3¼ percent has been used in the computation of both benefits and costs for the Hillsdale Lake. The use of this interest rate is in accordance with plan formulation standards and procedures.

RECREATION BENEFITS

Senator BIBLE. Please explain the $812,000 recreation benefit.

Colonel MILLER. Yes, sir. Recreation attendance at Hillsdale Lake is estimated to be 950,000 recreation days initially and 1,600,000 recreation days in the year 2020. Discounting the future growth yields an annual benefit of $1,296,000. Included are fish and wildlife benefits of $484,000 provided by the Bureau of Sport Fisheries and Wildlife. The remainder, $812,000, is the general recreation benefit. This benefit is based on full development of the recreation potential of the project.

Senator BIBLE. Without local cooperation, will the benefits be reduced?

Colonel MILLER. Yes, sir. The benefits will be recomputed based on the scale of development to be contracted for prior to construction. Because the estimated cost of recreation development is consistent with the benefits, a reduced scale of recreational development should not have an adverse effect on the benefit-cost ratio.

Senator BIBLE. What provision has been made for the commercially valuable walnut woodland referenced by Mr. Knighton?

Colonel MILLER. There are no significant hardwood forests of potential commercial value in the Hillsdale Lake area. In areas where such forests do exist, private industries are invited to submit bids for the purchase of the trees of commercial value.

INDIAN LAKE, KANS. (DEFERRED FOR RESTUDY)

Senator BIBLE. There is nothing in the budget, and local interests have requested $40,000. What is your capability on this project?

General MORRIS. Mr. Chairman, the feasibility of this project is being restudied and the report of the District Engineer has not been completed. In view of the status of the project, the Corps of Engineers does not have a capability for fiscal year 1974.

KANSAS CITY, KANS. (1962 MODIFICATION)

Senator BIBLE. The budget request was $2,500,000. The House committee has allowed $2,500,000, and local interests have requested $3,500,000. What is your capability on this project?

General MORRIS. Our capability on this project is $3,500,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $1 million?

General MORRIS. The additional amount would be used to advance the completion date of the Armourdale unit by 3 months to December 1975.

LAWRENCE, KANS.

Senator BIBLE. The budget request was $900,000. The House committee has allowed $900,000, and local interests have requested $1,500,000. What is your capability on this project?

General MORRIS. Our capability on this project is $900,000, the same as the budget, Mr. Chairman.

ONAGA LAKE, KANS.

Senator BIBLE. The budget request was $90,000. The House committee has allowed $200,000, and local interests have requested $200,000. What is your capability on this project?

General MORRIS. Our capability on this project is $200,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $110,000?

General MORRIS. The additional amount would be used to advance the completion date of preconstruction planning by 6 months.

PERRY LAKE AREA (ROAD IMPROVEMENTS), KANS.

Senator BIBLE. Budgetary reserve will be available in fiscal year 1974, but there was no budget request. Local interests have requested $2,400,000. What is your capability on this project?

General MORRIS. Mr. Chairman, the $100,000 in budgetary reserve for this project is scheduled for release in the second quarter of fiscal year 1974. This amount will be adequate to initiate and complete preconstruction planning and consequently we have no additional capability for the project in fiscal year 1974.

TOMAHAWK LAKE, KANS.

Senator BIBLE. There is nothing in the budget, and local interests have requested $40,000. What is your capability on the Tomahawk Lake project?

General MORRIS. Mr. Chairman, the feasibility of this project is being restudied and the report of the district engineer has not been completed. Subject to the submission of a favorable restudy report, our capability on the Tomahawk Lake project is $40,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Tomahawk Lake, Kansas

Summarized Financial Data:

Estimated Total Appropriation Requirement		$ 29,600,000
Future non-Federal Reimbursement	$3,566,000	
Estimated Federal Cost (Ultimate)		$ 26,034,000
Estimated non-Federal Cost:		3,566,000
Reimbursement: Recreation	$3,566,000	
Total Estimated Project Cost		$ 29,600,000
Allocations to Date		0 1/
Balance to Complete		$ 29,600,000
Amount that could be used in FY 1974		$ 40,000

Authorization: Flood Control Act of 1970.

Location and Description: The proposed Lake would be located on Tomahawk Creek in Johnson County, Kansas, in the communities of Leawood and Overland Park. Preliminary plans provide for construction of an earthfill dam about 79 feet high and 2,900 feet long to create a lake with a total storage capacity of about 32,100 acre-feet for flood control, possible water supply, water quality control, fish and wildlife, recreation, and sediment reserve.

Proposed Operations: Subject to the submission of a favorable restudy report, the amount of $40,000 could be used to initiate preconstruction planning.

Justification: The Tomahawk Lake will control the runoff from about 24 square miles of land in the Tomahawk Creek Basin. The flood of record in the basin occurred in September 1961 causing damages of nearly $8 million. A recurrence of this flood at 1972 conditions would cause damages estimated at $19.8 million. Operated as a unit in the Blue River Basin, Tomahawk Lake, together with three other lakes, and downstream Blue River Channel Improvement, would provide a substantial degree of protection to important urban developments in the Kansas Citys, including the Leeds industrial area, the Blue Valley Industrial District, small business, and residential areas, as well as railroad and highway transportation routes. The benefit-to-cost ratio is estimated to be 1.00 to 1.

The average annual benefits are listed below:

Current Estimate July 1972 Base (100-year life)

Flood Control	$	1,425,600
Water Quality		230,000
Fish and Wildlife		96,000
Recreation		384,000
TOTAL	$	2,135,600

1/ Excludes $20,000 General Investigation funds for restudy.

Tomahawk, Indian and Wolf-Coffee Lakes, Kans.

OPPOSITION

Senator Bible. Mr. V. M. Dostal, an attorney in Leawood, Kans., has provided the members of both the Senate and House Appropriations Subcommittees with testimony of his opposition to the construction of Tomahawk Lake located in Johnson County, Kans. Mr. Dostal, in referencing a letter of April 30, 1973, which he received from the Kansas City District, Corps of Engineers, states that you are budgeting office and manpower time during the coming year for preconstruction planning even though the directed restudy is not complete. Please comment.

Colonel Miller. The Kansas City District Office has not budgeted office or manpower time during the coming fiscal year for preconstruction planning. The initiation of preconstruction planning is contingent upon the restudy showing a favorable benefit-cost ratio and additional funds being appropriated for planning.

Senator Bible. Mr. Dostal has stated that most of those who spoke at the public meeting held on January 15, 1973 at the Shawnee Mission South High School were in opposition to the Tomahawk Lake project. Is this so?

Colonel Miller. The official record of the public meeting does not substantiate Mr. Dostal's statement that most of those who spoke at this public meeting opposed the project. Twenty-six persons wishing to make a statement spoke at the meeting. There were 15 persons favoring the project, 9 persons opposing, and 2 parties who were uncommitted.

Senator Bible. Mr. Dostal mentioned that, "We have not received a transcript of the meeting" referring to the public meeting held on January 15, 1973 at the Shawnee Mission South High School. Have transcripts been made available?

Colonel Miller. The District Engineer of the Kansas City District, Corps of Engineers, at the public meeting held on January 15, 1973, informed those present in his speech that "the meeting is being recorded by a court reporter and a transcript of the meeting will be available in about 30 days to anyone who would like one for the cost of reproduction." The address to which one might forward correspondence was included in the public meeting notice which was mailed to Mr. Dostal, and was given again at the public meeting. To date, the district office has not received a request by Mr. Dostal for a copy of the transcript.

LEAWOOD MAYOR, PROJECT OPPONENT

Senator Bible. Mr. Dostal pointed out in his testimony that in every local election in Leawood, Kans., where the Tomahawk Lake project has been an issue, the opponent of the project has always won handily. He also mentioned that the city council and the mayor of that city remain opposed to the project. Can you comment on this?

Colonel Miller. Yes, sir. Mr. Dostal's statements that the city council and the mayor of Leawood, Kans., remain opposed to the lake project is apparently correct. The predecessor mayor did favor the project, however. The present city council and mayor of Leawood, Kans., still

oppose the project. I cannot judge whether the candidates who were elected to a local public office won because the project was an issue or for other reasons. In contrast to the overwhelming referendum implied by Mr. Dostal, the city of Overland Park, Kans., in which approximately 60 percent of the lake's surface lies at multiple-purpose pool level and approximately 75 percent at flood pool, has endorsed the project. Residents of Leawood, Kans., who endorsed the project at the public meeting made statements to the effect that the opposition expressed by an official from their district was not representative of the majority of the people who elected him.

Senator BIBLE. Mr. Dostal has suggested that the average value of land as determined by well-qualified consultants is near $7,000 per acre in the project area. How does this figure compare with the one you are using in the restudy?

Colonel MILLER. Using all the parameters indicated by Mr. Dostal for arriving at average land costs, preliminary appraisals indicate that the average land value would be under $5,000 per acre. This is strictly for land costs which do not include improvements. All elements of real estate costs will be included in the total project cost and fulfill the requirements set forth by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646.

CONSTRUCTION COSTS INCREASE

Senator BIBLE. Local economic consultants in the engineering and construction fields have advised Mr. Dostal that the cost of construction has gone up 5 percent per year since the original report was calculated around 1964; therefore, on this basis he has calculated the total cost of the Tomahawk Lake to be in excess of $50 million. Is this cost in agreement with your cost projection?

Colonel MILLER. Cost estimates for Tomahawk Lake reflecting current land and construction costs are now being prepared and will be presented in the restudy which is to be completed this summer. We, of course, do not attempt to project our costs based on an assumed time of project construction. Rather, the costs are reviewed and updated on an annual basis.

Senator BIBLE. In Mr. Dostal's testimony, he highlighted the fact that in spite of all of the heavy rainfalls this spring, there have been no flooding problems in the Blue River Basin.

Colonel MILLER. The Blue River Basin, being relatively small, requires a hard rain of several inches in 12 to 24 hours to produce a serious flood. An example of this is the record flood which occurred in September 1961, caused by 6.23 inches of rain in 18 hours. Examination of the rainfall records for this spring for the basin show that the maximum 24-hour accumulation was only 1.85 inches. The rainfall during this spring has occurred at fairly regular intervals spaced several days apart. This spacing allows time for the runoff to drain out of the basin before the next rain, thereby preventing that concentration of runoff necessary to cause serious flooding. There have been some out-of-bank flows in the basin, but fortunately these were not great enough to cause serious problems.

RESTUDY PROGRESS

Senator BIBLE. Mr. Dostal describes the mood of the community as being that the project will never be built. He reviews the hardships resulting from the delay caused by the impending restudy. Has the restudy progressed to a level so that you are able to tell whether the project appears to be economically feasible or not?

Colonel MILLER. No, sir. The economic calculations for the restudy have not been finalized. The results of these studies will be made public upon completion of the restudy.

Senator BIBLE. Dr. John A. Marsh, of Overland Park, Kans., also appeared before this subcommittee and requested that no funds be appropriated for Tomahawk Lake and Indian Lake until the results of the restudy are available. Is the Indian Lake restudy progressing in parallel with the study on Tomahawk Lake?

Colonel MILLER. Yes, sir. The restudy which will be completed this summer encompasses both these projects. As you know, we are not requesting funds this year on either one.

Senator BIBLE. When will the environmental impact statements be filed?

Colonel MILLER. Sir, we have, of course, been conducting environmental studies as part of our restudy. If the restudy is favorable, we should be able to produce a draft environmental statement very shortly thereafter.

Senator BIBLE. Dr. Marsh also suggested that the carryover funds from fiscal year 1973 for Wolf-Coffee Lake should be ample since this project cannot be justified independent of Indian and Tomahawk Lakes. Is this so?

Colonel MILLER. No, sir. The Wolf-Coffee Lake project is well justified as an integral unit of the authorized system for flood control in the Blue River Basin. Without the other elements of the system, the need for Wolf-Coffee becomes even more critical in terms of protecting existing flood-plain development. For that reason, we are requesting new appropriations to continue preconstruction planning in fiscal year 1974.

TOWANDA LAKE, KANS.

Senator BIBLE. There is nothing in the budget. Local interests have requested $100,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $100,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Towanda Lake, Kansas

Summarized Financial Data:

Estimated Total Appropriation Requirement		$ 37,900,000	
Future non-Federal Reimbursement		1,250,000	
Estimated Federal Cost (Ultimate)			$ 36,650,000
Reimbursement:			1,250,000
Water Supply	$ 750,000		
Recreation	500,000		
Other	0		
Total Estimated Project Cost			37,900,000
Allocations to Date			0
Balance to Complete			37,900,000
Amount that could be utilized in FY 1974			100,000

Authorization: 1965 Flood Control Act

Location and Description: The project is located in Butler County, Kansas, on Whitewater River, about 3/4 mile northwest of Towanda, Kansas. The plan of improvement consists of a rolled-earth embankment, and a controlled spillway. The embankment would be 11,460 feet in length, including the spillway, with a height of 82 feet above the streambed. Total storage of the lake would be 208,000 acre-feet, of which 133,500 acre-feet would be for flood control, 46,500 acre-feet for conservation, and 28,000 acre-feet for sedimentation.

Proposed Operations: The amount of $100,000 would be used to initiate preconstruction planning.

Justification: Towanda Lake is a unit in the plan for the control of floods in the Walnut River Basin. Construction of this project would provide substantial flood protection to 18,000 acres of rural land in the basin. The flood of record occurred in April 1944 and caused damages estimated at $1,580,000 (1972 prices). Floods average once every year and have a duration of 2 days. The most recent flood was in April 1970 and caused approximately $200,000 damage. The properties that would be protected by the project include cropland, pasture and oil production, with an estimated value of $26,700,000 (1972 prices). Construction of the project would develop a dependable water supply of 2.0 MGD; provide dilution water to help solve the water quality problem in the lower basin; and provide outdoor recreation for an estimated 560,000 annual visitors; and sport fishing and hunting to help meet the regional demands. The benefit-to-cost ratio is 1.18 to 1. The average annual benefits for the project are broken down as follows:

Flood Control	$ 637,000
Water Supply	39,000
Water Quality Control	620,000
Recreation	562,000
Redevelopment	40,000
Total	1,898,000

Winfield, Kans.

Senator Bible. Budgetary reserve will be available in fiscal year 1974, but there was no budget request. Local interests have requested $100,000. What is your capability on this project?

General Morris. There is no additional capability on this project beyond use of the budgetary reserve, Mr. Chairman.

Wolf-Coffee Lake, Kans.

Senator Bible. The budget request was $120,000. The House committee has allowed $120,000, and local interests have requested $150,000. What is your capability on this project?

General Morris. Our capability on this project is $150,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $30,000?

General Morris. The additional amount would be used to continue the preconstruction planning.

Big South Fork National River and Recreation Area, Ky. and Tenn.

Senator Bible. There is nothing in the budget and local interests have requested $50,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project, subject to authorization, is $50,000 to initiate preconstruction planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Big South Fork National River and Recreation Area, Kentucky and Tennessee

Summarized Financial Data:

Estimated Federal Cost	$32,850,000
Estimated non-Federal Cost	0
Total Estimated Project Cost	$32,850,000
Appropriation to Date	0
Preconstruction Planning Estimate	450,000
Balance to Complete (Corps of Engineers)	$32,850,000
Amount that could be used in Fiscal Year 1974	50,000

Authorization: Not yet authorized

Location and Description: The proposed project is located in south central Kentucky and north central Tennessee, in McCreary County, Kentucky and Scott, Morgan, Pickett and Fentress Counties, Tennessee.

Proposed Operations: Subject to authorization the amount of $50,000 would be utilized to initiate preconstruction planning of the project in FY 1974.

Justification: The project will provide for acquisition and preservation of an area of unique natural beauty along Big South Fork and its tributaries. About 125,000 acres would be acquired. Developments, consonant with the objective of preserving existing values, will be provided as needed to accommodate public visitation and enjoyment of the area.

Camp Ground Lake, Ky.

Senator Bible. There is nothing in the budget, and local interests have requested $50,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project, subject to authorization, is $50,000 to initiate preconstruction planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Camp Ground Lake Kentucky

Summarized Financial Data:

Estimated Total Apprn. Requirement	$48,100,000		
Future non-Federal Reimbursement	7,564,000		
Estimated Federal Cost (Ultimate-Corps of Engineers)			$40,536,000
Estimated non-Federal Cost			7,564,000
Cash Contribution $ 0			
Reimbursement:			
Water Supply		$3,580,000	
Recreation and Fish & Wildlife Enhancement		3,984,000	
Total Estimated Project Cost			48,100,000
Allocations to Date			0
Balance to Complete (Corps of Engineers)			48,100,000
Amount that could be used in FY 1974			50,000

Authorization: Not Authorized.

Location and Description: The proposed dam site is located in north-central Kentucky on Beech Fork of the Rolling Fork of Salt River, about 49.1 miles above the Beech Fork-Rolling Fork confluence. This site, in Washington and Nelson Counties, is about 1.5 miles northeast of Maud, Kentucky. The proposed project consists of a rolled-earth dam with multiple level outlets.

Proposed Operations: Subject to authorization the amount of $50,000 would be utilized to initiate preconstruction planning of the project in FY 1974.

Justification: Camp Ground Lake will operate as a unit of the general comprehensive plan for flood control and related water resource development in the Salt River Basin. The project, in combination with other presently authorized reservoirs in the Salt River Basin, will aid in the reduction of flood flows along Beech Fork and lower Rolling Fork and, to a lesser degree along the Ohio River. The drainage area above the dam site is approximately 438 square miles. The flood control storage of Camp Ground Lake would benefit about 20,000 acres of flood plain on Beech Fork and lower Rolling Fork. The project would provide storage for low-flow augmentation in the interest of water quality control, for water supply and for general fish and wildlife recreational opportunities.

The benefit-cost ratio for this project is 1.5 to 1. The average benefits of $5,909,000 are broken down as follows:

Flood Control	$1,539,400
Water Supply	444,000
Water Quality Control	451,000
Recreation:	
General	3,059,000
Fish & Wildlife	116,000
Area Redevelopment	300,000
TOTAL	5,909,000

Carr Fork Lake, Ky.

Senator Bible. The budget request was $2,700,000. The House committee has allowed $2,700,000, and local interests have requested $3,100,000. What is your capability on this project?

General Morris. Our capability on this project is $3,100,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $400,000?

General Morris. The additional amount would be used to advance the recreation facilities by 1 year; however, there would be no advance of the overall project completion date.

Eagle Creek Lake, Ky.

OPPOSITION

Senator Bible. Mr. W. B. Stamper, representing the Eagle Creek Environmental Protection Association, testified that the estimated benefit-cost ratio for the Eagle Creek Lake project is 1.08 to 1 based on a January 31, 1973, report from the Louisville District Corps of Engineers. He also stated that this is reported to be the lowest ratio of any Corps project in Kentucky. Would you please comment?

Colonel Eineigl. The figures to which Mr. Stamper refers are correct based on 1966 data updated to 1972 values. Studies on Eagle Creek Lake are currently underway with preliminary indications that the estimated project costs will be significantly lower and the benefit-cost ratio somewhat higher than the updated figures.

Senator Bible. Mr. Stamper also states that the Corps reports that the dam is necessary to protect 6,500 acres below the proposed damsite yet the record flood in March 1964 flooded only 5,800 acres throughout the extent of Eagle Creek, including acreage both above and below the proposed damsite. Would you please comment concerning this matter?

Colonel Eineigl. The 5,800 acres inundated by the 1964 flood included only the area downstream from the proposed damsite. The 1964 flood height has a statistical frequency of recurrence of approximately once in a 70-year period. The flood plain evaluated for Eagle Creek was somewhat larger than the 1964 flood area, exceeding an area expected to be inundated by a flood recurring once in a 100-year period. In addition, flood control benefits would accrue to the lower Kentucky River and the Ohio River downstream from the proposed damsite.

Senator Bible. Mr. Stamper further states that the Corps correctly indicates there are 87 urban buildings below the dam that are subject to flooding. However, he expressed concern that the Corps plans to remove a reported 300 residents from their homes above the proposed damsite in order to accommodate the protection of those buildings. Would you please comment in this regard?

Colonel Eineigl. Although the Eagle Creek Lake will provide protection to the urban buildings along Eagle Creek only approximately 20 percent of the flood control benefits on Eagle Creek are identified as urban in nature. The primary flood control benefits are agricultural. In addition, a majority of flood control benefits accrue as a result of protection along the lower Kentucky River and the Ohio River downstream from the project.

EFFECT OF PROJECT ON RECREATIONAL FACILITIES

Senator BIBLE. Would you please comment on the effect that the proposed project, if built, might have on the private recreational facilities that have been developed in the Eagle Creek area?

Colonel EINEIGL. Existing recreational developments in a project area are taken into account during our investigations. In addition, private development provides a different kind of recreation experience than the type that would be provided by Eagle Creek Lake. Because of the projected recreation needs that have been estimated for the area surrounding the project, it is expected that the proposed Eagle Creek Lake would not have any adverse effect on existing recreational developments.

Senator BIBLE. Mr. Stamper expresses concern with the cost of the water supply storage space in the Eagle Creek Lake project. Would you please comment on this?

Colonel EINEIGL. During the current studies for the Eagle Creek Lake project, four alternative single-purpose water supply impoundments were investigated in cooperation with the Commonwealth of Kentucky Department for Natural Resources and Environmental Protection. As a result of these joint studies, a least-cost alternative project for comparison was developed with a construction cost of $980,000. The cost to the Commonwealth of Kentucky for the water supply storage space included in Eagle Creek Lake is presently estimated at $777,000 and would provide the same water supply yield as the least-cost alternative.

FALMOUTH LAKE, KY.

CAPABILITY

Senator BIBLE. The budget request was $40,000. The House committee allowed $100,000, and local interests have requested $100,000. What is your capability on this project?

General MORRIS. Our capability on this project is $100,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $60,000?

General MORRIS. The additional amount would be used to advance completion of preconstruction planning by 2 months.

OPPOSITION

Senator BIBLE. This year we have received opposition testimony from Mr. H. W. Batte; Mr. Darrel Fegan of the Licking Valley Protective Association; and Mr. Brent Blackwelder of the Environmental Policy Center. I will raise specific questions from their testimony. Would not the construction of floodwalls be sufficient to provide the needed flood control, and would floodwalls be cheaper, quicker and more effective? What other alternatives have been considered?

Colonel EINEIGL. A number of alternatives including floodwalls were considered in the Special Report on Alternatives on Falmouth Lake, dated August 1971. Floodwalls were considered around Falmouth, Covington, and Newport Wilders. These floodwalls could provide the needed flood control for those areas more quickly, but

they would have little effect on the remaining Licking River and no beneficial effect on the Ohio River from whence the preponderance of benefits that would be attributable to Falmouth accrue. The construction costs for these floodwalls are considerably less than the costs of the Falmouth Lake project, but updated costs and benefits for the floodwalls show that none of the three smaller projects are economically justified. Two other alternatives have been studied. These are a multismall reservoir system on the tributaries to the Licking River and channel improvement downstream from the proposed Falmouth Dam. Neither of these projects was economically justified. The study of alternative sizes for the Falmouth Lake will continue.

Senator BIBLE. Mr. Batte testified that 36,000 acres of land would be required for the project. Mr. Fegan testified that 45,000 acres of the best farmland will be required for this project. What is the amount of land required? What would be the impact on the economy of this area, and will the people be able to relocate in the same area if they choose?

Colonel EINEIGL. In our latest studies the amount of land required has been reduced considerably due to a change in interpretation of the joint Army-Interior memo on real estate acquisition policy. Also, flowage easements would be acquired on more land, therefore taking less land out of private ownership. Our present estimate is that an order of 30,000 acres may be required of which 12,000 acres are estimated to be cropland or croppable land. The exact amount of land required will not be known until the recommended plan is selected. The initial impact on the tax base will be adverse to the area's economy, but ultimately, as in our other projects, the project should have a beneficial effect on the regional economy, as documented in the "Socio-Economic Study of the Impact of the Falmouth Lake Project" which study was performed by Spindletop Research. The above reference study concluded that the economic impact on the region would be positive. There appears to be sufficient area for the persons displaced by the project to relocate in the same general area if they so choose.

TAXPAYER BURDEN

Senator BIBLE. The estimated cost of the project has risen to $73 million and no doubt will be over $100 million when completed. Can the taxpayers of the area meet this burden, and how much will the local interest of this project be?

Colonel EINEIGL. At the present stage of the Falmouth study, we are unable to state with precision what the project would cost. Our present estimate of project cost is slightly less than the $73 million mentioned in the question. Firm, cost figures should be available in about 2 months. Any cost escalation thereafter would more likely be attributed to changes in the value of the dollar than to any other reason. At the present time there is no evidence that non-Federal interests will be required to financially participate. They would need to participate if recreation and/or water supply are included as project purposes. How much they would need to contribute is dependent upon how much they want out of the project. Discussions are continuing with the Commonwealth of Kentucky directed toward firming up the Commonwealth's desire.

Senator BIBLE. The population of Falmouth is 2,600 people. Is the cost commensurate with the protection on what would be provided by the dam?

Colonel EINEIGL. The primary area which would benefit from the Falmouth project is not the city of Falmouth or the Licking River Basin, although they would be benefited, but rather the areas contiguous to the Ohio River, including the Cincinnati standard metropolitan statistical area, the Louisville standard metropolitan statistical area and intervening areas and Riverine communities as well as Ohio River areas downstream from Louisville. If flood protection of the city of Falmouth were the only objective of the project, then without question the Falmouth Lake project would not be the answer. However, in view of all of the flood control needs along the Lower Licking River and the Ohio River, the data available indicates that the Falmouth Lake Project is the most functional and economical solution.

AREA SUSCEPTIBILITY TO FLOODING

Senator BIBLE. Does the flooding in the past years compel the construction of the dam? How susceptible is the area to serious flooding?

Colonel EINEIGL. Flood problems on the Licking River are considerable. Since 1961, there have been 10 floods that have resulted in $3.3 million damage on the Lower Licking River Basin. Had Falmouth Lake been in operation, about 95 percent of these damages would have been eliminated. In this same period, 13 rises along the Ohio River would have been affected by stage reduction. The benefits to Falmouth Lake in the area between Cincinnati and Louisville would have been about $7.2 million during this 12-year period.

Senator BIBLE. Is it necessary to construct the dam when Cave Run Lake which is under construction and due to be completed shortly, is upstream from Falmouth Lake as proposed?

Colonel EINEIGL. Falmouth and Cave Run were authorized as a part of system primarily to reduce flooding on the Ohio River. This system is not yet complete and additional storage is needed in several Ohio River tributaries. The flood damage reduction benefits from control of the Licking Basin, primarily on the Ohio River, would be substantial and would significantly exceed the project costs. The Falmouth and Cave Run dams are approximately 110 stream miles apart and Falmouth would control a large drainage area downstream from and uncontrolled by Cave Run.

IMPACT OF OPPOSITION ON CORPS PLANS

Senator BIBLE. There seems to be considerable opposition from many groups in the area to be affected by the dam, including almost unanimous opposition by the areas' elected officials. What impact has this opposition had on the Corps' plans for the dam, and should not such large opposition compel the Corps to propose alternative plans for flood protection? Also, if the opposition is so great that the Corps decides not to build a dam, can they request that a project be deauthorized?

Colonel EINEIGL. The corps is most certainly cognizant of the public opinion regarding the Falmouth project. This awareness has generated the Spindeltop impact study and the additional study of alternatives

to the project. These have been undertaken in an effort to balance the needs recognized to exist for flood control and other water-related needs and the impact upon the people of the area. Although there is local opposition, there is also large support from many groups in the downstream area including elected officials. The Corps of Engineers is currently studying the size and scope of the Falmouth Lake. If these studies find there are valid reasons for not constructing the project, an unfavorable report would be submitted. Then it would be up to Congress to deauthorize the project.

Senator BIBLE. Many people believe that the South Licking River caused the recordbreaking 1964 flood. Falmouth Dam will not control the South Licking. Would you comment, please?

Colonel EINEIGL. With Falmouth Dam in place, the channel capacity below the damsite would have been sufficient to keep the flows from the South Licking River below flood stage. Some minor agricultural damage would probably occur.

Senator BIBLE. There is concern that the reservoir will fill with silt and become useless. Would you please comment?

Colonel EINEIGL. The reservoir pool will be designed to capture sediment for at least a hundred years without interfering with other project purposes.

KEHOE LAKE, KY.

Senator BIBLE. The budget request was $100,000. The House has included $198,000, and local interests have requested $198,000. What is your capability on this project?

General MORRIS. Our capability on this project is $198,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $98,000?

General MORRIS. The additional amount would be used to complete preconstruction planning.

MARTINS FORK LAKE, KY.

Senator BIBLE. The budget request was $1,700,000. The House committee has allowed $2,400,000, and local interests have requested $2,400,000. What is your capability on this project?

General MORRIS. Our capability on this project is $2,400,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $700,000?

General MORRIS. The additional amount would permit award of phase 2 road relocations and relocation of a school at Smith, Ky., in fiscal year 1974. There would be no advance of the overall project completion date.

MIDLAND, KY.

Senator BIBLE. There is nothing in the budget, and local interests have requested $50,000. What is your capability on this project? project?

General MORRIS. Mr. Chairman, our capability on this project, subject to authorization is $50,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Midland, Kentucky

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$11,400,000
Estimated non-Federal Cost		873,000
Cash Contribution	$0	
Other Costs	873,000	
Total Estimated Project Cost		12,273,000
Allocations to Date		0
Balance to Complete (Corps of Engineers)		11,400,000
Amount that could be used in FY 1974		50,000

Authorization: Not authorized

Location and Description: The proposed local protection project is located in eastern Kentucky on the Licking River immediately below the existing Cave Run Lake project. The proposed project consists of six levee sections totalling 59,650 feet, a 250-feet concrete wall section, and 1,500 feet of channel realignment.

Proposed Operation: Subject to authorization the amount of $50,000 would be utilized to initiate preconstruction planning of the project in FY 1974.

Justification: The area below the Cave Run Lake project is the site of a potential urban service center located on the Licking River. Chronic unemployment and underemployment in this economically depressed area leaves the residents far below the National level of income and economic well being. Residual flooding would impede development within the flood plain and hinder realization of the full potential of this proposed regional employment and urban service center. The proposed project construction would be phased to match the master planned urban development. This Local Protection project, with the Cave Run Lake project in operation, would protect the core of the area of development against the standard project flood. The benefit-cost ratio for this project is 0.23 to 1. The average benefits of $55,200 are broken down as follows:

Flood Control	$38,000
Land Enhancement	11,700
Area Redevelopment	5,500
Total	55,200

PAINTSVILLE LAKE, KY.

OPPOSITION

Senator BIBLE. We have opposition testimony from Mr. Brent Blackwelder, of the environmental policy center, and others, who testified that over 3,000 oil wells are to be found in the drainage basins for the Paintsville and Yatesville Dams. It is felt that the Corps of Engineers may not fully understand the potential implication of this fact or has not properly disclosed them to the public.

Colonel EINEIGL. We are aware of the oil wells in the two basins. Approximately 45 producing oil and gas wells are located within the acquisition limits of the Paintsville project. There are 38 producing oil and gas wells within the acquisition limits of the Yatesville project. All oil wells are low producers with records showing that production has declined approximately 70 percent since 1964. All wells on project lands will be acquired in fee and all leases extinguished except in the producing well area of the Paintsville project. In that producing area, running about midway through the reservoir, oil and gas will be acquired in fee and leases appropriately subordinated to project purposes.

Based on the reported 3,000 oil wells in the drainage basins, this would average approximately 64 oil wells per acre. The Corps has not made a detailed listing of wells outside project limits, but from a general reconnaissance of the basins the above average number of wells per acre seems high. One exception, however, is two areas just outside acquisition limits of the Paintsville project where oil well density runs as high as 70 wells per acre. Most of these wells are either owned or being purchased by Ashland Oil and Refining Co. and are being operated efficiently with stream pollutants being under control.

EXISTENCE OF GEOLOGICAL FAULT

Senator BIBLE. Mr. Brown, of the Committee on Paintsville Lake, testified that a geologic fault exists under the area to be covered by the proposed reservoir. What problems will this cause and did the Corps know of its existence prior to their request for funds.

Colonel EINEIGL. The existence of the faults in the vicinity of the Paintsville project has been known for many years. The location and description are contained in numerous publications. The Corps was aware of the subsurface conditions during survey report studies in the 1960's.

In addition, a geologic reconnaissance of the proposed Paintsville Reservoir Area was conducted during the early design stage with all structural features being mapped and evaluated, including the faults in the area. Due to the age of the structural features, reservoir induced seismic activity is not anticipated in the Paintsville area. Design of the Paintsville Dam and appurtenances, however, will include considerations for seismic accelerations which is a current design procedure for all Corps of Engineers reservoir projects. In this regard, an expert in the field of geophysics will assist in the evaluation of the geophysical aspects of the Paint Creek fault. No problems in developing a proper design are anticipated.

ECONOMIC LOSS

Senator BIBLE. Mr. Brown also testified that the economic loss that would result from building the reservoir is at least $8 million more than the benefits as calculated by the Corps. Are these estimates valid and if so, what is the implication?

Colonel EINEIGL. The April 12, 1973, issue of the Licking Valley Courier—West Liberty, Ky.—reported that landowners in Johnson and Morgan Counties had added up their estimates of the value of their homes, farms, and tobacco bases and concluded that the total worth of these assets exceeded by $8 million ". . . the $40 million the Corps claims the dam and park would be worth to motel owners and the State of Kentucky which would operate the recreational area." It is unlikely that assets included in the landowners' estimate are identical to those that would be acquired for project purposes or that their estimate of the value of such assets is in accord with standard real estate appraisal practices. Other questions concerning the time period, the discount rate, and projected selling price of tobacco and land utilized in this estimate also remain unanswered. The origin of the $40 million amount mentioned above is unknown.

From a national economic standpoint, studies indicate that project benefits exceed project costs. Although no regional economic analysis has been accomplished for this project it seems clear that expansion benefits should greatly exceed average annual project costs. Studies of the effects of public investment in water resources on local tax base has repeatedly shown that such investments result in an increase in tax base within a relatively short period.

Senator BIBLE. It is reported that 1,200 people representing an estimated 95 percent of the valley's property owners signed a petition in opposition to the construction of the dam. It appears that very little consideration is being given to the feelings of the people. Shouldn't the people's considerations be a major factor in any decision to build the dam?

Colonel EINEIGL. The petition referred to was presented to the district engineer at the landowners meeting in Paintsville on April 27, 1972. While it contains 1,151 names, there are numerous duplications in signatures. Our study indicates that only 66 signers are owners of property within the project area. This is less than 6 percent of all those who signed the petition, and approximately 20 percent of all owners in the area. In every project the Corps of Engineers is directed to study, the concerns and interest of the public at large are carefully considered. While it is recognized that in any water resources project numerous people are adversely affected, in formulating such project, it is necessary to consider the benefits to the general public, often over a large area, which result from the several project purposes.

RELOCATION OF CEMETERIES

Senator BIBLE. It has been reported that 76 cemeteries with 1,856 graves would have to be moved. What is your comment on this matter?

Colonel EINEIGL. The procedures developed by the Corps for handling this type relocation do take into account the feelings of the next of kin. Generally we try to relocate all cemeteries affected by a project

into a single new cemetery for each county affected. After the reinterment site is selected we make an exhaustive effort to contact the next of kin. Relatives are asked to select the section of the new cemetery they would like the grave to be moved into and are given the opportunity to reserve adjacent plots for future family burials. After these contacts are made with the next of kin and the courts approve our plans, a contract is awarded for the development of the new cemetery and for the actual disinterment and reinterment of the graves. Grave markers and monuments are reset on the new site and markers are provided for all unmarked graves. Once all the cemeteries are relocated, the new site is deeded to a trustee group or to a cemetery association. Under such an arrangement we can be reasonably assured that the new cemetery will be properly maintained.

Red River Lake, Ky.

Senator Bible. The budget request was $300,000. The House committee has allowed $300,000 and local interests have requested $600,000. What is your capability on this project?

General Morris. Our capability on this project is $300,000, Mr. Chairman, the same as the budget request.

Royalton Dam and Channel Improvement, Ky.

Senator Bible. There is nothing in the budget, and local interests have requested $50,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project, subject to authorization, is $50,000 to initiate preconstruction planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Royalton Dam and Channel Improvement, Kentucky

Summarized Financial Data:

Estimated Total Apprn. Requirement (Corps Projects)	$ 55,700,000	
Future non-Federal Reimbursement (Corps Projects)	1,903,000	
Estimated Federal Cost (Ultimate Corps Projects)		$53,797,000
Estimated non-Federal Cost (Corps Projects)		2,738,000
Cash Contribution $ 0		
Reimbursement:		
Water Supply	$ 684,000	
Recreation and Fish & Wildlife Enhancement	1,219,000	
Other Costs	835,000	
Estimated Federal Cost (US Dept of Agriculture Projects)		3,750,000
Estimated non-Federal Cost (US Dept of Agriculture Projects		2,134,000
Total Estimated Project Cost		62,419,000
Allocations to Date		0
Balance to Complete (Corps of Engineers)		55,700,000
Amount that could be used in FY 1974		50,000

Authorization: Royalton Dam, Ky. not authorized. Channel Improvement at Salyersville authorized by the 1941 Flood Control Act. 1/

Location and Description: The proposed site for the Royalton Dam is located on the Licking River about 282 miles above its confluence with the Ohio River. This site, in Magoffin County, is about 12 miles southeast of Salyersville and about 75 miles southeast of Lexington, Kentucky. The channel improvement elements of the proposed project are located along the main stem of the Licking River and along State Road Fork, a tributary, in the vicinity of Salyersville.

Proposed Operations: Subject to authorization of the Royalton Dam, the amount of $50,000 would be utilized to initiate preconstruction planning of the project in FY 1974.

Justification: The Royalton Dam and Channel Improvement elements are integral parts of a comprehensive plan for the development and efficient utilization of the water and related resources of the Salyersville-Royalton Area in the Appalachian region of Eastern Kentucky in order to stimulate economic expansion therein and enhance the welfare of its residents.

The Corps of Engineers' water control elements, in combination with the proposed Department of Agriculture water control and related elements, will, in general, reduce water related impediments to the growth potential of the area and will specifically (1) provide an adequate supply of lands reasonably free from flooding; (2) provide water supplies adequate to meet all reasonably expected water supply and water quality control needs; and (3) provide sufficient sites for industrial, commercial, residential and public purposes responsive to the development plan.

The economic analysis of the upper Licking River basin plan is not adaptable to the usual presentation because explicit focus on future economic development of the area. The benefit-cost ratio for this project is 0.29 to 1. The average annual benefits of $1,105,000 are broken down as follows:

Flood Control	$546,000
Water Supply	44,000
Water Quality Control	90,000
Recreation:	
General	160,000
Fish & Wildlife	28,000
Land Enhancement	237,000
TOTAL	1,105,000

1/ The authorized local protection levee for Salyersville is inadequate for current problems and needs, and its deauthorization was recommended by the Secretary of the Army in the April 1971 report on Development of Water Resources in Appalachia.

YATESVILLE LAKE, KY.

Senator BIBLE. The budget request was $600,000. The House committee has allowed $600,000 and local interests have requested $1 million. What is your capability on this project?

General MORRIS. Our capability on this project is $600,000, the same as the budget request, Mr. Chairman.

ATCHAFALAYA RIVER AND BAYOUS CHENE, BOEUF, AND BLACK, LA.

OPPOSITION

Senator BIBLE. Mr. Brent Blackwelder, the Washington representative of the Environmental Policy Center, has urged that funds be withheld from this project. He has stated that this navigation channel through Louisiana's coastal wetlands would bisect and pollute a State scenic river of the highest water quality and would adversely impact commercial and recreational fish and wildlife resources estimated in value at over $3 million annually. Would you please comment?

Colonel EDGAR. Last year, the National Wildlife Federation furnished opposition testimony objecting to the "cut" through Louisiana marsh. I would again like to point out that construction of this channel does not require any virgin cut through the marsh but improves existing watercourses now used for navigation. The project will cross Bayou Penchant, but not the part that has been designated a State scenic river. Actually, the navigation channel will coincide with Bayou Penchant for about 0.8 of a mile. This section of the bayou has been used for commercial navigation for many years, and is excluded from the Scenic Rivers Act in that the scenic rivers portion goes from Bayou Chene to Lake Penchant.

Further, as we testified to you last year, the corps will fully comply with the provisions of NEPA and no construction will be initiated prior to the submission of the environmental impact statement for this project to CEQ. The draft EIS was submitted to CEQ on April 25, 1972, and the final statement should be submitted in August 1973. The delay in furnishing the final statement resulted from local interests request for reconsideration of spoil areas which have now been resolved. The final statement will cover the project as presently planned.

We can neither confirm nor deny Mr. Blackwelder's estimate of $3 million annually as we have no detailed information on his estimate. The entire Louisiana coastline is a valuable asset to the area and to the national economy both from the standpoint of commercial and recreational fish and wildlife assets and from the petroleum industry. Our present evaluation is that no significant long-term detrimental effects will result to the water quality of Bayou Penchant because of this construction.

BAYOU BODCAU AND TRIBUTARIES, LA.

Senator BIBLE. Budgetary reserve will be available in fiscal year 1974, but there was no budget request. Local interests have requested $300,000. What is your capability on this project?

General MORRIS. Our capability on this project is $170,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $170,000?

General MORRIS. The additional amount would be used to advance construction on the Flat River-Loggy Bayou levee.

BAYOU LAFOURCHE AND LAFOURCHE-JUMP WATERWAY, LA.

OPPOSITION

Senator BIBLE. Mr. Brent Blackwelder, the Washington representative of the Environmental Policy Center, has offered no objection to the maintenance of the existing channel, but has expressed strong opposition to the portions of the auxiliary channel and Lafourche-Jump Waterway that will traverse the Pointe au Chien and Wisner game management areas. Mr. Blackwelder has suggested that if the oil and sulphur industries need an enlarged channel to move its goods, then those industries should furnish a route rather than transgressing public lands dedicated to fishery and wildlife resources. Why have you chosen routes through these areas?

Colonel EDGAR. The Lafourche-Jump Channel—Leeville to Grand Isle—will primarily be an enlargement of an existing State-owned waterway, Southwestern Louisiana Canal; however, there will be some new channel through saline marshes and bay bottoms. This route was selected because a channel already existed over a large part of the route. No other alternatives were investigated in depth. Oyster leases exist in the vicinity of the channel alinement and considerable controversy has developed over construction of this reach of channel. The Wisner wildlife management area lies along the southern edge of the Southwestern Louisiana Canal and some spoil would be placed in the saline marshes of the Wisner tract. Because of doubtful title evidence, multiple ownership and prolonged negotiations with lessees of oyster-bed areas, local interests have had very little success in obtaining rights-of-way. Construction of this reach in the near future is doubtful and in any event would not be constructed prior to public meetings and compliance with requirements of NEPA.

PROPOSED AUXILIARY CHANNEL

The proposed auxiliary channel—Leeville to Gulf Intracoastal Waterway—will traverse brackish, intermediate, and fresh-water marshes. The majority of the channel construction over the selected route will consist of the enlargement of the existing waterway. The route was selected for this reason since it afforded the least disruption to existing development. The excavated material from construction will be placed on either side of the channels, held with retention dikes and the effluent returned to the waterway by way of weir boxes.

Modification of Bayou Lafourche north of Golden Meadow to provide sufficient dimensions was authorized in 1950 and construction is still impracticable because of the highways on both banks of the bayou and the numerous wharves and buildings extending into and along the bayou. As Bayou Lafourche could not be improved, the auxiliary channel was planned. Two routes were studies, both having a southern terminus at Leeville primarily because no major land routes would be cut. The authorized alinement utilizes a natural waterway known as

Grand Bayou Blue, Grand Bayou Canal, and Cutoff Canal with land cuts where necessary. The other alternative followed the same route from Leeville to the latitude of Golden Meadow and then followed a land route paralleling the 40-arpent line. This latter alinement was studied again during the planning stage and was still found to be less favorable than the planned alinement. Either of these auxiliary channel routes would cross the Pointe au Chien area. The Pointe au Chien area is relatively new, being established in 1968. The Louisiana Wildlife and Fisheries acquired this tract with the full knowledge of the federally authorized project and has furnished rights-of-way allowing construction of the project. In connection with preparation of the environment impact statement, a public meeting has been scheduled for August 1973 so that all viewpoints can be obtained. No construction on the auxiliary channel is planned before that meeting.

CALCASIEU RIVER AT DEVIL'S ELBOW, LA.

Senator BIBLE. There is nothing in the budget, and local interests have requested $800,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $800,000 to initiate construction.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Calcasieu River at Devil's Elbow, Louisiana

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$4,620,000
Estimated Federal Cost (US Coast Guard)		62,000
Estimated Non-Federal Cost		422,000
Cash Contribution	$ 0	
Other Costs	422,000	
Total Estimated Project Cost		$5,104,000
Allocations to Date		150,000
Balance to Complete		4,470,000
Amount that could be utilized in FY 1974		800,000

Authorization: Section 201 of the 1965 Flood Control Act (Authorized 1970)

Location and Description: The project is located in southwest Louisiana on the east side of the Calcasieu River and Pass, Louisiana, project in Calcasieu Parish about 12 miles south of Lake Charles. The project provides for a channel extending from the existing ship channel in Calcasieu River at Mile 22.6 eastward through Devil's Elbow and in the land cut into the industrial park, having a depth of 40 feet and width of 400 feet, for a distance of about 2.8 miles, and a turning basin at the head of the channel, 40 feet deep, 1,000 feet wide and 1,000 feet long.

Proposed Operations: The amount of $800,000 would be used to initiate construction.

Justification: The industrial park and navigation channel are acquisitions of the Lake Charles Harbor and Terminal District, a state agency, at a cost of over 5 million dollars. An aluminum industrial complex, financed by industrial revenue bonds issued by the Calcasieu Parish Police Jury, has been completed. This industrial plant imports alumina from Australia and manufacturers and ships by deep draft transportation, calcined coke and carbon electrodes. The existing navigation channel was excavated to a project depth of 35 feet in 1966 by local interests. By 1970 it had shoaled to less than 30 feet. Ships for transportation of calcined coke are having difficulty reaching the docks. The alternate method of transporting raw materials to and products from the aluminum plant is to anchor the ships in the Calcasieu River and move the materials between the plant and ship by barge. The benefit-to-cost ratio is 1.4 to 1. The average annual benefits are presently estimated at $507,000 for navigation and $31,000 for area redevelopment.

Lake Pontchartrain and Vicinity, La.

OPPOSITION

Senator Bible. Mr. Henry Schindler, Jr., president of the St. Bernard Parish police jury expressed opposition to the Lake Pontchartrain and vicinity project. Please comment on this.

Colonel Edgar. The Lake Pontchartrain, La., and vicinity hurricane protection project is under construction. The draft environmental impact statement has been reviewed by all pertinent Federal and State agencies and local interests. Only one portion of the project, representing about 10 percent of the total project cost, requires further environmental evaluation. That portion is a levee which will protect St. Charles Parish and it is the part of the project which has received the major environmental opposition. However, in St. Bernard Parish around the Chalmette area construction has reached a point where relatively little work remains to be done to provide substantial protection. Stoppage of the project at this time would be a gross injustice to the people residing in that area.

Senator Bible. The Honorable Frank N. Cusimano, mayor of Slide, La., speaking for the city council strongly opposes any appropriation of funds for the hurricane protection structure in the Rigolets Waterway. He contends the structure would offer no protection to New Orleans and render the north shore of Lake Pontchartrain vulnerable to flooding. Would you address this please?

Colonel Edgar. One of the most salient features of this project is a barrier across the tidal passes connecting Lake Pontchartrain and the Gulf of Mexico through Lake Borgne. The purpose of this barrier is to limit hurricane-generated inflow into Lake Pontchartrain. By restricting this inflow, the average water levels in Lake Pontchartrain can be maintained at near normal levels throughout a hurricane. The barrier will reduce hurricane stages in the lake by as much as 6 feet, thus providing flood protection to all areas surrounding the lake, and likewise reduce the height requirement for protective works on the lakeshore.

The barrier is comprised of three major structural complexes: the Seabrook complex, the Chef Menteur Pass complex, and the Rigolets complex. Each complex includes a gated control structure, a navigation structure for marine access, and a levee system to adjoin the barrier structures.

The gated flood control structures at each complex will remain open at all times, except under hurricane conditions. These structures will permit daily tidal flow in Lake Pontchartrain and will not serve to elevate the water level in the lake.

Michoud Canal, La.

OPPOSITION

Senator Bible. Mr. Henry Schindler, Jr., President of the St. Bernard Parish Police Jury has presented this committee with a resolution from the St. Bernard Parish Police Jury opposing projects in the Lake

Borgne Area without reference to specific projects, and has offered comments by the St. Bernard Parish Planning Commission, and the Regional Planning Commission, opposing various projects in that area. Mr. Schindler has stated and we quote, "The Corps of Engineers placed its priority on the construction of projects and seems to be trying to ignore the environment and all other detrimental aspects of their projects." He further states, "The public is not being adequately protected by the procedures actually being used by the Corps of Engineers." He has requested that no funds for design or construction be made available to the Corps until the final environmental impact statement has been received and the public has had an opportunity to comment on the statement. Would you address Mr. Schindler's comments?

Colonel EDGAR. Yes, sir. The Corps has and will continue to be resonive to the National Environmental Policy Act. The public is given an opportunity to comment on all environmental impact statements. Due to the heavy impact of the requirement of EIS's, it was necessary to schedule preparation of the statements over a period of time, with priority being given to the most controversial ongoing projects and projects on which construction has not started. All of the statements have not yet been filed. The resolution furnished by the police jury has requested that no design or construction funds be appropriated for projects or studies located within, or partially within, Lake Borgne Basin Area or within, or partially within, St. Bernard Parish. The resolution contains a prohibition against appropriations for fiscal year 1974 in the budgeted amount of $28,203,000. This resolution could be construed to include Public Law 84–99 funds, which will be utilized to make repairs to the Mississippi River levees and channel improvement features damaged by this year's major flood. This would prohibit rehabilitation of the features that have just protected St. Bernard Parish from extensive flooding.

Senator BIBLE. Specifically mentioned in supporting papers presented by Mr. Schindler is opposition to the Michoud Canal, La., project. Would you comment on the status of this project and opposition you have received to it.

Colonel EDGAR. Yes, sir. Construction of this project has not yet started. The opposition regarding this project has been in the selection of the spoil area for the dredged material that will be taken from the proposed channel. In order to avoid using unleveed natural marsh, a 400-acre area in St. Bernard Parish previously used for spoil is proposed for reuse during construction of this project. An additional area of 380 acres of marsh in St. Bernard Parish, La., in the area protected by the Lake Pontchartrain, La., hurricane protection project, is proposed for disposal of dredge material during subsequent maintenance of the project. This project has been extensively reviewed to minimize the effects of project construction on the environment. There has been extensive coordination between the Corps, the Federal and State fish and wildlife agencies, and the local sponsor. No construction on this project will be undertaken until all the requirements of NEPA have been compiled with. The final EIS is scheduled to be sent to CEQ in September 1973.

Mississippi River-Gulf Outlet, La.

OPPOSITION

Senator Bible. Mr. Schindler refers to an environmental report prepared for the police jury and submitted to this committee in which they claim initial losses, attributed to the Mississippi River-Gulf Outlet, Louisiana, project due to dredging and destruction of natural marsh and estuarine areas, of $850 million to the natural resources of the area. Have you received this report, and if so, what are your conclusions?

Colonel Edgar. We have had an opportunity to make a preliminary review of the report to which you refer. While we agree the Mississippi River-Gulf Outlet project has had a significant impact on the Lake Borgne Estuary, we disagree as to the magnitude of effect on the area. The dollar values are not supported in the report and are considered overstated. The area still supports a very active sports and commercial fishery, considerable hunting, and oyster production is still high, although the producing areas have shifted with changes in salinities. The report will be further reviewed, and any pertinent facts will be considered in our environmental studies of the area.

Mississippi River Outlets, Venice, La.

Senator Bible. There is nothing in the budget, the House committee has allowed $150,000, and local interests have requested $250,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $250,000 to initiate construction.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Mississippi River Outlets, Venice, Louisiana

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$7,170,000
Estimated Federal Cost (US Coast Guard)		80,000
Estimated Non-Federal Cost		1,600,000
Cash Contribution	$ 0	
Other Costs	1,600,000	
Total Estimated Project Cost		$8,850,000
Allocations to Date		239,000
Balance to Complete		6,931,000
Amount that could be utilized in FY 1974		250,000

Authorization: 1968 River and Harbor Act

Location and Description: The project area is located in Plaquemines Parish in the Louisiana coastal marsh and offshore areas adjacent to the Mississippi River near its mouth. The plan of improvement consists of the enlargement of Baptiste Collette Bayou between the Mississippi River and Breton Sound, and Grand and Tiger Passes between the Mississippi River and the Gulf of Mexico, to a depth of 14 feet below mean low gulf level, over a bottom width of 150 feet.

Proposed Operations: The amount of $250,000 could be used to initiate construction.

Justification: The Mississippi River Delta area is one of the most prolific oil and gas producing areas in the United States. Drilling in the Gulf of Mexico has extended into depths well over 100 feet. Large incomes are being derived by both the State of Louisiana and the United States from sale of leases of the inland and offshore water areas. Drilling is anticipated to continue for many years. A large base of operations for oilfield supplies and equipment has been developed at Venice, the farthest downstream point on the Mississippi River accessible by land transportation. Ship channels are maintained in South and Southwest Passes. Bars in open water at the entrances to other distributary channels of the Mississippi River have been formed by sediments from the river. These bars limit the use of the distributary channels to very shallow-draft vessels of 1 to 3 foot draft depending on tide levels. A considerable saving in distance to be traveled could be obtained by enlargement of the existing channels of Baptiste Collette Bayou and the Grand-Tiger Passes. These channels would provide benefits to the petroleum industry by savings in the cost of transportation of materials for platform construction, drilling materials, and materials for specialized well services. The channels also would provide a shorter route for commercial fishing vessels desiring to go from one side of the Mississippi River to the other side to increase their catch, or to return to their unloading point. Baptiste Collette Bayou would be used by the U. S. Coast Guard in the maintenance of navigation aids on the Mississippi River-Gulf Outlet project. Intangible benefits would accrue from the use of channels by sport fishermen and hunters and in the transportation of crews to and from the offshore areas during and subsequent to completion of drilling operations. The benefit-to-cost ratio is 2.1 to 1. The average annual benefits, all navigation, are estimated at $1,944,000.

NEW ORLEANS TO VENICE, LA.

Senator BIBLE. The budget request was $4,100,000. The House committee has allowed $7,500,000 and local interests have requested $11,500,000. What is your capability on this project?

General MORRIS. Our capability on this project is $11,500,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $7,400,000?

General MORRIS. The additional amount would be used to advance levee construction in reach B–2 and the barrier plan.

OVERTON-RED RIVER WATERWAY, LOWER 31 MILES, LA.

Senator BIBLE. The budget request was $720,000. The House committee has allowed $720,000 and local interests have requested $4 million. What is your capability on this project?

General MORRIS. Our capability on this project is $4 million, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $3,280,000?

General MORRIS. The additional amount would be used to advance construction of revetment at Grand Lake, Alligator Bayou, and Pump Bayou.

RED RIVER EMERGENCY BANK PROTECTION, LA., ARK., OKLA., AND TEX.

Senator BIBLE. The budget request was $1,400,000. The House committee has allowed $1,400,000 and local interests have requested $5,100,000. What is your capability on this project?

General MORRIS. Our capability on this project is $5,100,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $3,700,000?

General MORRIS. The additional amount would be used to advance closures at Kateland, Clarence, and Coushatta and to advance revetment at Brown, St. Agnes, and Cadney.

RED RIVER WATERWAY—MISSISSIPPI RIVER TO SHREVEPORT, LA.

Senator BIBLE. The budget request was $4,500,000. The House Committee has allowed $4,500,000 and local interests have requested $8,900,000. What is your capability on this project?

General MORRIS. Our capability on this project is $8,900,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $4,400,000?

General MORRIS. The additional amount would be used to advance revetment at Vick and to advance bank stabilization at Hayden, Fort DeRussey, and Ben Routh.

Senator BIBLE. There is nothing in the budget, and local interests have requested $80,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $80,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Red River Waterway, Shreveport, Louisiana, to Vicinity of Index, Arkansas

Summarized Financial Data:

Estimated Federal Cost		$ 85,600,000
Estimated non-Federal Cost		10,800,000
Cash Contribution	$ 1,350,000	
Other	9,450,000	
Total Estimated Project Cost		96,400,000
Allocations to Date		0
Balance to Complete		85,600,000
Amount that could be utilized in FY 1974		80,000

Authorization: 1968 River and Harbor Act

Location and Description: The project is located in northwest Louisiana, southwest Arkansas and northeast Texas, along the Red River between Shreveport, Louisiana, and Index, Arkansas. It passes through the following parishes in Louisiana and counties in other States: Caddo and Bossier Parishes, Louisiana; Bowie County, Texas; Little River, Hempstead, Miller and Lafayette Counties, Arkansas. The project provides for realigning the channels of Red River from Shreveport, Louisiana, to Index, Arkansas, by means of dredging, cutoffs and training works, and for stabilizing its banks by means of revetments, dikes and other methods. Facilities to provide opportunities for recreation and for fish and wildlife development are an integral part of the project.

Proposed Operations: The amount of $80,000 would be used to initiate preconstruction planning.

Justification: Red River, in its natural state, is a meandering stream characterized by wide fluctuations in stage and continuing erosion of the banks. Many acres of productive land and improvements are lost each year to this caving and other lands are underdeveloped because of the insecurity of investment. Efforts at bank stabilization, to date, have been limited to individual locations for protection on an emergency basis. These efforts by local and Federal interests are inadequate to provide an efficient or economical overall approach to the problem. This project is of broader scope and the substantial effort is expected to result in the following benefits. Approximately 1,115 acres of land previously lost each year will be retained and the crops and other improvements (such as levees, railroads, highways, bridges, pipelines, power lines, telephone lines, and buildings) will be protected. Average annual crop damage and non-crop damage prevented is estimated to be $1,099,100 and $804,900, respectively. Security provided by the works will result in increased land utilization on approximately 72,000 acres of land, of which 54,700 acres are cleared and 17,300 acres are woodland. This project unit also will provide protection to work previously in place, which, in the past, has been subject to excessive attack because of the isolated program. The benefit to cost ratio is 1.07 to 1. The average annual benefits for the project are broken down as follows:

Flood Control	$ 2,942,100
Recreation	1,400,100
Area Redevelopment	630,800
Total	4,973,000

Senator BIBLE. There is nothing in the budget, and local interests have requested $800,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $800,000 to resume preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Dickey-Lincoln School Lakes, Maine

Summarized Financial Data:

Estimated Total Appropriation Requirement		$328,000,000
Future non-Federal Reimbursement	$300,200,000	
Estimated Federal Cost (Ultimate)		27,800,000
Estimated non-Federal Cost		
Reimbursement:		
Power	$299,955,000	
Recreation	245,000	
Total Estimated Project Cost		328,000,000
Allocations to date		2,154,000
Balance to complete preconstruction planning		1,646,000
Amount that could be used in FY 1974		800,000

Authorization: Flood Control Act of 1965

Location and Description: Dickey Lake is located on the Upper Saint John River near the Town of Dickey, Aroostook County, Maine immediately above its confluence with the Allagash River. The project provides for an earth-fill dam and supplemental dikes impounding a reservoirs with gross storage capacity of 7,700,000 acre-feet for power, flood control and retreation. The Lincoln School Lake is located on the Saint John River 11 miles downstream from Dickey Lake and provides for an earth-fill dam impounding a reservoir with usable storage capacity of 30,000 acre-feet for purposes of regulating discharges from Dickey Lake and power generation.

Proposed Operations: The amount of $800,000 would be used to resume pre-construction planning.

Justification: The Dickey-Lincoln School Project is an integral unit of the comprehensive development and conservation of the water and power resources of the Saint John River Basin. Electric power will constitute the major benefits from the project and, due to power revenues, is fully reimbursable including interest. On-site annual power generation of 1.2 billion kilowatt-hours resulting from an installed capacity of 830 MW will provide needed power to the New England area. Additional power benefits will be realized at downstream Canadian power plants. Flood control storage provided by the project will eliminate flood damages below the site. The advent of low-cost power and flood protection would contribute significantly to the advancement of the economic climate of the State of Maine and the New England area. The Dickey-Lincoln School Project is located in the part of Aroostook County, Maine which is classified as a Title IV (1) Economic Development Area. The benefit-cost ratio is 2.1 to 1. Average annual benefits are estimated at $33,600,000, as follows:

Power	$31,540,000
Flood Control	56,000
Area Redevelopment	754,000
Recreation	1,250,000
Total	33,600,000

Baltimore Harbor and Channel, Md. and Va. (1970 Act)

Senator Bible, There is nothing in the budget, and local interests have requested $175,000. What is your capability on this project?

General Morris, Mr. Chairman, our capability on this project is $200,000 to initiate preconstruction planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Baltimore Harbor and Channel, Maryland and Virginia

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$128,700,000
Estimated non-Federal Cost		5,100,000
Cash Contribution	$ 0	
Other Costs	5,100,000	
Total Estimated Project Cost		133,800,000
Allocations to date		0
Balance to Complete (Corps of Engineers)		128,700,000
Amount that could be used in FY 1974		200,000

Authorization: 1970 River and Harbor Act.

Location and Description: Baltimore Harbor is situated at the head of the navigation portion of the Patapsco River, approximately 172 miles north of the Virginia Capes entrance to Chesapeake Bay. The improvement would provide for a uniform main channel, 50 feet deep and generally 800 or 1,000 feet wide through the Chesapeake Bay from the Virginia Capes to the port of Baltimore. Depths of 50, 49 and 40 feet would be provided in the branch channels of Curtis Bay, Northwest Branch-East Channel, and Northwest Branch - West Channel, respectively.

Proposed Operations: The amount of $200,000 would be used to initiate preconstruction planning.

Justification: Waterborne commerce through the port of Baltimore averaged 43,000,000 tons annually for the period 1959-1969. Over the next 50 years deep draft commerce is expected to increase from the present 21,000,000 tons annually to about 58,000,000 tons annually. Bulk commodities are moved most efficiently in large carriers, and the trend towards such carriers is clearly evident. With realization of this project, ships in the range of 50,000 to 100,000 DWT will be calling regularly. Benefits will result from the use of such fully loaded super-carriers over the 50 foot deep channel as opposed to the use of smaller ships over the present 42 foot deep channel. The current benefit-cost ratio is 1.8 to 1. Average annual benefits are $16,800,000 representing savings through more efficient operation of vessles.

WEYMOUTH FORE AND TOWN RIVERS, MASS.

Senator BIBLE. The budget request was $2,700,000. The House committee has allowed $3,700,000. What is your capability on this project?

General MORRIS. Our capability on this project is $3,700,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $1 million?

General MORRIS. The additional amount would be used to permit award of a continuing contract to remove all rock located in the project area. This would advance project completion 3 months from June 1975 to March 1975.

CEDAR RIVER HARBOR, MICH.

Senator BIBLE. There is nothing in the budget. Local interests have requested $664,000. What is your capability on this project.

General MORRIS. Mr. Chairman, our capability on this project is $100,000 to initiate construction.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Cedar River Harbor, Michigan

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$ 945,000
Estimated Federal Cost (U. S. Coast Guard)		15,000
Estimated non-Federal Cost		210,000
Cash Contribution	$ 175,000	
Other	35,000	
Total Estimated Project Cost		1,170,000
Allocations to Date		58,000
Balance to Complete		887,000
Amount that could be utilized in FY 1974		100,000

Authorization: 1965 River and Harbor Act

Location and Description: Cedar River Harbor adjoins the village of Cedar River, Michigan. It is located at the mouth of the Cedar River on the west shore of Green Bay, an arm of northern Lake Michigan, and is about 68 miles north of the city of Green Bay, Wisconsin. Nearest harbors are at Menominee, Michigan, 27 miles southwest and at Escanaba, Michigan, 29 miles northeast. The proposed improvement provides for a new rubble mound east pier, an entrance channel 100 feet wide and 10 feet deep in Green Bay, and an inner channel 80 feet wide and 8 feet deep in Cedar River.

Proposed Operations: The $100,000 would be used to initiate construction.

Justification: The proposed improvement will benefit recreational and light-draft commercial fishing through improvement of navigation facilities. Construction of adequate entrance and inner channels will greatly increase the value of the harbor for refuge by providing temporary anchorage and shelter to small recreational and commercial fishing boats on Green Bay during periods of storms. Additional benefits will accrue to sport fishing enthusiasts who will be able to fish from the new east pier. The benefit-to-cost ratio is 1.7 to 1. The average annual benefits for the project are broken down as follows:

Navigation	$ 72,200
Recreation	24,000
Total	96,200

Cross Village Harbor, Mich.

Senator Bible. There is nothing in the budget. Local interests have requested $85,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $30,000 to initiate preconstruction planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Cross Village Harbor, Michigan

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$ 1,340,000
Estimated Federal Cost (U. S. Coast Guard)		10,000
Estimated non-Federal Cost		1,280,000
Cash Contribution	$ 830,000	
Other	450,000	
Total Estimated Project Cost		2,630,000
Allocations to Date		0
Balance to Complete		1,340,000
Amount that could be utilized in FY 1974		30,000

Authorization: 1966 River and Harbor Act

Location and Description: Cross Village, Michigan, located in Emmet County, is situated on the northeasterly shore of Lake Michigan, about 23 miles east of St. James Harbor (Beaver Island), and approximately 26 miles northeasterly from Charlevoix Harbor, Michigan. The project provides for improvement of the harbor for light-draft craft by constructing general navigation facilities consisting of breakwaters having an aggregate length of about 2,300 feet, with recreational fishing facilities on the main breakwater; an anchorage and maneuver area of about 8 acres and 10 feet deep; and a flared entrance channel 12 feet deep, decreasing in width to 140 feet between the breakwaters.

Proposed Operations: The amount of $30,000 could be used to initiate preconstruction planning.

Justification: Northeastern Lake Michigan is reputed to be one of the roughest sections of water on the Great Lakes. Navigation for small craft in these waters is hazardous with the nearest harbors, Charlevoix, 26 miles southwest of Cross Village, and Mackinaw City, 35 miles to the northeast. Construction of the harbor will provide a harbor of refuge for the recreational and small commercial craft which cannot, with an acceptable degree of safety, traverse the area between Charlevoix and the Straits of Mackinac. Development of an adequate harbor at Cross Village will serve area fishermen who will benefit from a harbor closer to fishing grounds and, in addition, will furnish a base from which the Beaver Island ferry can operate in order to provide a shorter safer trip at a lower operating cost than is possible with the mainland base presently located at Charlevoix. The benefit-to-cost ratio is 1.16 to 1. The average annual benefits for the project are broken down as follows:

Navigation	$ 97,500
Fish and Wildlife	5,500
Area Redevelopment	11,000
Total	114,000

Forestville Harbor, Mich.

Senator Bible. There is nothing in the budget. Local interests have requested $85,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $30,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?
General MORRIS. Yes, sir.
[The statement follows:]

Project: Forestville Harbor, Michigan

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$ 965,000
Estimated Federal Cost (U. S. Coast Guard)		9,000
Estimated non-Federal Cost		3,175,000
Cash Contribution	965,000	
Other	$ 2,210,000	
Total Estimated Project Cost		4,149,000
Allocations to Date		0
Balance to Complete		965,000
Amount that could be utilized in FY 1974		30,000

Authorization: 1968 River and Harbor Act

Location and Description: Forestville Harbor, Michigan, located in Sanilac County is situated on the southwesterly shore of Lake Huron, about 14 miles south of Harbor Beach Harbor and 17 miles north of Port Sanilac Harbor, Michigan. The project provides for construction of a small craft harbor of refuge, consisting of two offshore breakwaters totaling about 2,240 feet in length with recreational fishing facilities on the main breakwater; an anchorage and maneuver area of about 6 acres, 8 feet deep; and a wide flared approach channel 10 feet deep, decreasing in width to 160 feet between the breakwaters.

Proposed Operations: The $30,000 would be used to initiate the preconstruction planning.

Justification: The westerly shore of Lake Huron, in the vicinity of Forestville, lies near the southern end of a 110 mile reach of open water and is exposed to large waves generated by strong and prolonged northerly winds. Hazardous sailing conditions exist during these periods, especially for small craft which are not capable of riding out storms. The area between Port Sanilac and Harbor Beach, covering a distance of about 30 miles, is particularly hazardous for small craft due to the lack of adequate shelter. These existing harbors are part of the original chain of small craft harbors, which were planned to accommodate the larger craft then being used for extended cruising. Harbors in the original chain are, in most cases, too far apart to provide a degree of safety consistent with the needs of the smaller boats now commonly used for cruising. The harbor will provide increased safety for the ever increasing number of smaller class recreational craft and will serve to stimulate recreational boating activity in the area. The benefit-to-cost ratio is 1.11 to 1. The average annual benefits for the project are broken down as follows:

Navigation	$ 94,600
Fish and Wildlife	8,400
Total	103,000

GRAND MARAIS HARBOR, MICH. (DIKE REHABILITATION)

Senator BIBLE. There is nothing in the budget. Local interests have requested $2 million. What is your capability on this project?

General MORRIS. Mr. Chairman, we have no capability on this project until a study is made within authority of the Chief of Engineers to determine the feasibility and scope of rehabilitation of the dike on this existing project.

GREAT LAKES CONNECTING CHANNELS, MICH.

Senator BIBLE. The budget request was $850,000. The House committee has allowed $850,000, and local interests have requested $1,250,000. What is your capability on this project?

General MORRIS. Our capability on this project is $850,000, Mr. Chairman; the same as the budget request.

OPPOSITION

Senator BIBLE. The National Wildlife Federation has again expressed opposition to the deepening of shipping channels in the Great Lakes, and recommend that dredging spoil be deposited above the highwater mark or on land disposal sites out of flood plains. The federation does not think that the Corps of Engineers has given enough attention to returning dredge spoil to the land. Will you please provide the committee comments on this matter.

Colonel EINEIGL. As we testified last year, the Senate recognized that the Great Lakes connecting channels may be inadequate for present and prospective deep-draft commerce, and authorized the Great Lakes connecting channels and harbors study in 1969. The study will determine the engineering, economic, environmental, and social feasibility of providing navigation channels and harbors with a 32-foot depth and suitable widths. The authorized project depth is 27 feet.

Three "superlakers" were placed into operation during the 1972 shipping season. The largest, 1,000 feet long and 105 feet wide, carried over 2 million net tons of iron ore pellets in 35 loads through the locks.

An 858-foot vessel carried over 1.5 million net tons of pellets in 33 loads and an 806-foot vessel carried over 1.2 million net tons of pellets in 37 trips through the locks. Another 806-foot vessel was placed into operation in May 1973. A barge-tug combination is being fabricated that will have overall dimensions of 1,000 feet long by 105 feet wide. Deepening the channels and harbors would permit these larger vessels to be more fully utilized and thereby allow for more economical movement of commodities on the Great Lakes.

The fiscal year 1974 budget request includes funds, for the study, to continue an environmental assessment of existing conditions; continue preliminary engineering studies to determine the effect channel deepening will have on lake levels; and to continue preliminary economic studies of interlake and foreign commodity movement.

BEND WIDENING

It should be noted that the current widening and deepening of critical bends in the St. Marys River to insure safe navigation by the larger vessels which now utilize the waterway is a part of the current 1946 and 1956 project authorizations for the Great Lakes Connecting Channels. The initial construction contract for the bend-widening work was awarded on May 8, 1972, with the entire work scheduled for completion by June 30, 1976. In the interest of minimizing the impact on the environment, alternate, island disposal areas have been located for the three bend-widening contracts in lieu of disposal of the dredged material in deep water in Lake Munuscong, as originally planned. Disposition of the spoil material for the initial contract will provide a diked disposal island of such configuration as to form a protected basin for possible use by small craft during adverse weather conditions. Subsequent to the completion of dredging operations the disposal areas will be landscaped with plant life indigenous to the area.

In addition to returning dredge spoil to the land as discussed above, the Corps has been actively involved in a diked disposal program authorized by section 123 of Public Law 91–611, December 31, 1970. The Corps of Engineers is to construct contained dredge spoil disposal facilities of sufficient capacity for a period not to exceed 10 years. Before establishing each such facility, the Corps shall obtain the concurrence of appropriate local governments and shall consider the views and recommendations of the Administrator of the Environmental Protection Agency and shall comply with requirements of the National Environmental Policy Act of 1969.

Non-Federal interests are required to furnish all lands, easements, and rights-of-way necessary for the construction, operation, and maintenance of the facility and after completion of its use for disposal purposes, the non-Federal interests shall retain title to all lands, easements, and rights-of-way, and with the permission of the Corps, may develop the property themselves or convey it to another party. The Corps is conducting disposal area site selection surveys, negotiating with non-Federal interests, proceeding with the engineering and design and preparing plans and specifications for various diked disposal areas. Contained dredge spoil disposal facilities have been in use for several years in the Detroit River and in the western end of Lake Erie.

TAWAS BAY HARBOR, MICH.

Senator BIBLE. The budget request was $20,000. The House committee has allowed $20,000 and local interests have requested $200,000. What is your capability on this project?

General MORRIS. Our capability on this project is $20,000, Mr. Chairman, the same as the budget request.

TOMBIGBEE RIVER AND TRIBUTARIES, MISS. AND ALA.

Senator BIBLE. The budget request was $1,700,000. The House committee has allowed $700,000 and local interests have requested $1,700,000. Can you use the budget amount on this project?

General MORRIS. No, sir. Due to unavoidable delays, our capability for fiscal year 1974 has been reduced to $700,000.

YAZOO RIVER, MISS.

Senator BIBLE. There is nothing in the budget, and local interests have requested $100,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $100,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Yazoo River, Mississippi

Summarized Financial Data:

Estimated Total Appropriation Requirement (Corps of Engineers)	$93,700,000	
Future Non-Federal Reimbursement	1,742,000	
Estimated Federal Cost (U.S. Coast Guard)	154,000	
Estimated Federal Cost (Ultimate)		$92,112,000
Estimated Non-Federal Cost:		2,868,000
Reimbursement: Recreation	1,742,000	
Other	1,126,000	
Total Estimated Project Cost		94,980,000
Allocations to Date		0
Balance to Complete		93,700,000
Amount that could be utilized in FY 1974		100,000

Authorization: 1968 River and Harbor Act

Location and Description: The Yazoo River is formed by the junction of the Tallahatchie and Yalobusha Rivers at Greenwood, Mississippi. It flows in a generally southwesterly direction 169 miles to a junction with the Mississippi River at Vicksburg, Mississippi. The plan of improvement provides for a dependable 9-foot navigation channel from the mouth of the Yazoo River to Greenwood, Mississippi, by construction of a lock and dam, near the mouth of the river; channel realignment and dredging; addition of 600,000 acre-feet of storage in the existing Sardis Reservoir; and revision of regulation schedules for the flood control storage in the existing Sardis, Enid and Grenada Reservoirs.

Proposed Operations: The amount of $100,000 would be used to initiate preconstruction planning.

Justification: Yazoo River channel widths vary from 300 feet to 500 feet. Under existing conditions, 9-foot depth is available about 46 percent of the time, with controlling depths over the bars of about 4 feet during low water periods. The low water periods are affected by rainfall and thus are unpredictable. Numerous sharp bends restrict the movement of tows of even one or two barges and the fixed highway bridge at Belzoni (mile 116.1) restricts traffic upstream from that point during high river stages. The river is navigable only in daylight because of its tortuous course which is further compounded by overhanging timber and snags. The proposed one-lock plan will provide a 9-foot navigation channel from the mouth of the Yazoo River to Greenwood, Mississippi, 97 percent of the time. The benefit-cost ratio is 1.7 to 1. The average annual benefits are estimated as follows:

Navigation	$7,525,000
Recreation	1,136,000
Fish and Wildlife	57,000
Area Redevelopment	385,000
Total	$9,103,000

BLUE RIVER CHANNEL, KANSAS CITY, MO.

Senator BIBLE. The budget request was $15,000. The House committee has allowed $15,000, and local interests have requested $100,000 for planning. What is your capability on this project?

General MORRIS. Our capability on this project is $60,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $45,000?

General MORRIS. The additional amount would be used to complete surveying and mapping and initiate phase I of the general design memorandum. Completion of preconstruction planning would be advanced about 2 months.

BRAYMER LAKE, MO. (DEFERRED FOR RESTUDY)

Senator BIBLE. There is nothing in the budget, and local interests have requested $25,000. What is your capability on this project?

General MORRIS. Mr. Chairman, we do not have any capability pending the completion of the Grand River project feasibility review study and its review by higher authority.

BROOKFIELD LAKE, MO.

Senator BIBLE. Budgetary reserve funds will be available in fiscal year 1974, but there was no budget request. Local interests have requested $100,000. What is your capability on this project?

General MORRIS. Mr. Chairman, available funds will be adequate to continue preconstruction planning. Planning delays and the need to coordinate water supply requirements with the State of Missouri preclude the need for additional funds in fiscal year 1974 and consequently our capability for fiscal year 1974 is zero.

CLARENCE CANNON DAM AND RESERVOIR, MO.

Senator BIBLE. The budget request was $16,400,000. The House committee has allowed $16,400,000 and local interests have requested $18,000,000. What is your capability on this project?

General MORRIS. Our capability on this project is $18,000,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $1,600,000?

General MORRIS. The additional amount would be used to advance land acquisition and construction of relocations and recreation facilities.

HARRY S TRUMAN DAM AND RESERVOIR, MO.

Senator BIBLE. The budget request was $27,500,000. The House commitee has allowed $27,500,000, and local interests have requested $50 million. What is your capability on this project?

General MORRIS. Our capability on this project is $35 million, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $7,500,000?

General Morris. The additional amount would be used to continue relocations and construction on going contracts. The additional funds would advance completion dates of project and power-on-line by 6 months to December 1979 and September 1979, respectively.

Irondale Lake, Mo.

Senator Bible. There is nothing in the budget. Local interests have requested $100,000. What is your capability on this project?

General Morris. Mr. Chairman, we have no capability on this project since the economics of this project are now marginal pending review of Public Law 92–500 relative to the need and justification for water quality storage.

Little Blue River Channel, Mo.

Senator Bible. The budget request was $700,000. The House committee has allowed $700,000, and local interests have requested $1 million. What is your capability on this project?

General Morris. Our capability on this project is $1 million, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $300,000?

General Morris. The additional amount would be used to provide a more balanced schedule for the initial construction contract which would include additional work due to the modification of the project plan. Project completion date would not be changed.

Little Blue River Lakes, Mo. (Land Acquisition)

Senator Bible. The budget request was $2,500,000. The House committee has allowed $2,500,000, and local interests have requested $6 million. What is your capability on this project?

General Morris. Our capability on this project is $4,500,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $2 million?

General Morris. The additional amount would be used to advance land acquisition, especially those lands subject to cost escalation and rapid urban development. Completion of land acquisition would be advanced from October 1976 to April 1976.

Long Branch Lake, Mo.

Senator Bible. The budget request was $1 million. The House committee has allowed $1,200,000, and local interests have requested $1,400,000. What is your capability on this project?

General Morris. Our capability on this project is $1,400,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $400,000?

General Morris. The additional amount would permit earlier acquisition of the lake area which would reduce hardship on local owners. Project completion date would not be effected.

Senator BIBLE. The budget request was $3 million. The House committee has allowed $3 million and local interests have requested $4,500,000. What is your capability on this project?

General MORRIS. Our capability on this project is $4,500,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $1,500,000?

General MORRIS. The additional amount would be used to advance land acquisition and construction of the dam abutment.

OPPOSITION

Senator BIBLE. Mr. Sam C. Orr of Cuba, Mo., appeared before this subcommittee concerning the Meramec Park Lake project. Additionally, Mr. Paul M. Denk, attorney at law, of St. Louis, Mo., appeared before this subcommittee in opposition to this project. Mr. Orr and Mr. Denk contend that Meramec Park Lake will be far from the city of St. Louis and will not serve the recreation needs of that metropolitan area.

Colonel EDGAR. Mr. Chairman, there will be good access to Meramec Park Lake via Interstate 44. The lake site can be reached in an hour to an hour and one-half driving time from most of the St. Louis area. This will be a much shorter driving time over a better highway than required to reach the Lake of the Ozarks. As pointed out by Mr. Orr, "Hundreds of workers (from the project area) commute to jobs in St. Louis." The distance to employment corresponds to the distance to the proposed lake recreation facilities.

Senator BIBLE. It is also Messrs. Orr and Denk's position that the land that has been purchased by the Corps and the lower Meramec River flood plain should be used for a national recreation area or national park. Would you comment on this?

Colonel EDGAR. Yes, sir, as we testified last year in detail, the Bureau of Outdoor Recreation and the National Park Service proposed on October 26, 1969, the establishment of a national recreation area in the Meramec Basin.

Senator BIBLE. Messrs. Orr and Denk further contend that recreation areas should be closer to hardcore metropolitan areas. How do you respond to this?

Colonel EDGAR. Mr. Chairman, as we indicated in detail in testimony last year, the Meramec Basin is the logical area adjacent to the St. Louis Metropolitan area that has the capability to satisfy the water-based recreation needs of that metropolitan complex.

IMPACT ON ECONOMY, TAX BASE AND SOCIOLOGICAL ASPECTS

Senator BIBLE. Mr. Orr, Mr. Orville Burnett, presiding judge of the county court of Crawford County, Mo., of Bourbon, Mo., and Mr. Herbert J. McLain, Sr., of Eureka, Mo., filed formal statements with this subcommittee on May 22, 1973. It was the position of these witnesses that the Meramec Park Lake would not improve the economy and

sociological aspects of the project area nor would it increase the tax base of Crawford County. Also, Mr. Elmer G. King, a private citizen of Crawford County, Mo., is concerned as to the detrimental effects the project may have on the city of Bourbon, Mo., and the entire affected area. How do you respond to these contentions?

Colonel EDGAR. Mr. Chairman, the major impact of the Meramec Park Lake will be reflected by a rise of a recreation industry and the development of supportive commercial enterprises. The economic activities will provide income for local residents and provide a multiplier impact on the nonrecreation sectors of the local economy. Investment incentives will be provided private entrepreneurs and the value of surrounding property will be increased. The volume of small businesses, hotels, restaurants, retail trade segments and other related enterprises will increase. The local tax base of the community will increase, thus providing finances for the further development of roads, water supplies, sidewalks and other social facilities. Since Crawford County and the project area are within reach of the St. Louis metropolitan area, other benefits are likely to arise through the construction of vacation or second homes for living or recreation purposes. Recent research concerning the impact on population changes of reservoir projects similar to Meramec Park Lake may shed additional light on potential impacts on the project area. A 1972 report by the Corps Kansas City district entitled, "Harry S Truman Dam and Reservoir Project," utilized a combined general and detailed approach as a means of analysis. In this report three general economic indicators of change were investigated: retail sales, local government income, and population changes. The results are as follows: (1) Lakes do in fact increase local retail sales; (2) population analysis indicated that population increased more rapidly in counties containing lakes than in adjacent counties without lakes; (3) migration rate changes proved constantly higher in lake areas than in adjoining nonlake counties; and (4) general local government revenues were greater in counties with lakes than in adjoining counties. Additionally, general debt for lake counties was less than in adjoining nonlake counties.

The detail economic interpretation of the same area presented a somewhat different view of lake counties. While population increases of all age groups were observed, the group 65 years of age and older increased the greatest, indicating that retired age groups were most influenced by recreation sites. This same study concluded that the general educational level of residents was largely unaffected by the presence or absence of a lake. Lastly, median family income increases showed no significant variations between lake counties and adjoining nonlake counties.

WATER SUPPLY STORAGE

Senator BIBLE. Mr. Orr, Mr. Burnett and Mr. Emmett W. Schlueter of Bourbon, Mo., a member of the Committee to Save the Meramec, Inc., in their statements contend there is no need for water supply storage in the Meramec Park Lake. Would you address this point please?

Colonel EDGAR. Mr. Chairman, the storage for water supply in Meramec Park Lake is 237,700 acre-feet. This storage can be released when needed to meet the requirements for water supply in the lower Mera-

mec Basin during periods of low flow. This storage will also be available for water supply withdrawal by towns above the dam near the lake.

Virtually all water used in the upper basin is obtained from ground water sources, which are available in sufficient quantity to meet the needs of the upper basin to the year 2070. However, the city of Sullivan in the upper Meramec Basin, has recently experienced difficulty with the deep wells upon which it relies for water. The lake adjacent to the city would provide a reliable source of water which could probably be more economically pumped into the distribution system. In the lower basin ground water is supplemented by withdrawals from the Meramec and Missouri Rivers. Water supply requirements were furnished by the Public Health Service on a seasonal basis for three time periods—1970, 2020, and 2070. Based on these data, supplemental water supply requirements were determined. It was found that by utilizing all available sources, the project requirements in the lower basin can be satisfied until about the year 1980, after which other sources will need to be developed. The St. Louis County Water Co. has confirmed the need for additional water supply in the lower basin. On September 29, 1971, the utility filed an application to install a second pumping plant on the lower Meramec River below State Highway 30 crossing near the town of Fenton, Mo. Meramec Park Lake which has an assigned economic life of 100 years, will be able to supply a minimum of 207 million gallons of water per day. This is sufficient to furnish each of 1.5 million people with approximately 140 gallons per day. The State of Missouri has executed a local assurance agreement of intent to pay for the water supply storage in Meramec Park Lake.

Additional Lakes in Meramec Basin

Senator Bible. Mr. Duane W. Woltjen of Manchester, Mo., appeared before this subcommittee concerning the Meramec Park Lake project. He appeared on behalf of the Citizens Committee To Save the Meramec, Inc. A copy of his formal statement dated May 22, 1973, was furnished the Corps of Engineers. Additionally, a copy of a statement of Mr. Paul M. Denk was furnished you. Mr. Woltjen and Mr. Denk contend that the Meramec Park Lake is only the first of some 30 lakes that will be constructed in the Meramec Basin. Would you comment on this contention, please?

Colonel Edgar. Mr. Chairman, by reference to House Document 525, page 1, paragraph 2, the following is found in report of the Chief of Engineers to the Secretary of the Army:

> The District and Division Engineers find that the most feasible plan of development to satisfy present and future water demands of the basin would consist of seven main stream reservoirs, 12 tributary stream reservoirs, 12 headwater reservoirs, 26 angler-use sites, and nine local protection levees. They recommend that initial Federal improvements be limited to those elements of the basin plan that current and project needs indicate should be constructed at this time, subject to certain local cooperation. Those would consist of five multiple-purpose reservoirs and 19 angler-use sites.

Congressional authorization is limited to Meramec Park Lake and Union Lake approved by the Flood Control Act of June 28, 1938, and Pine Ford Lake, Irondale Lake, I–38 Lake, and 19 angler-use sites approved by the Flood Control Act of 1966, Public Law 89–789, 89th

Congress, 2d session. Any reservoirs which may subsequently be recommended for construction in the Meramec Basin will require a new congressional authorization.

Senator BIBLE. Mr. Orville L. Burnett contends that this project "Will destroy three of the most beautiful rivers that we have in our country, namely, the Meramec, Courtois and Huzzah Rivers."

Colonel EDGAR. Mr. Chairman last year we answered this same question in detail. If I may, I will just summarize our comments.

The majority of the unique Ozark resources of the Meramec, Huzzah, and Courtois will be preserved or enhance. River conditions suitable for canoeists will be available more of the time, and through better access, camping will be improved. Meramec Park Lake will have a shoreline of 175 miles which will be accessible to the public and a water surface area at normal pool of 12,600 acres available for general recreation.

INADEQUATE ENVIRONMENTAL IMPACT STATEMENT

Senator BIBLE. Mr. Jerry M. Sugerman, chairman, Meramec Basin Subcommittee, Ozark Chapter of the Sierra Club, in his statement of May 22, 1973, contends the Meramec Park Lake environmental impact statement filed with the Council for Environmental Quality is inadequate and does not comply with the National Environmental Policy Act of 1969, and that the premises under which this project were formulated are obsolete. Would you comment on this?

Colonel EDGAR. Mr. Chairman, the environmental impact statement for Meramec Park Lake was prepared in accordance with appropriate, pertinent guidelines and procedures promulgated as a result of the National Environmental Policy Act. The EIS was filed with the CEQ in February 1971. Environmental studies and investigations are, of course, of a continuing nature. A revised and supplemental environmental impact statement has been prepared for this project on April 13, 1973; three copies of this document were mailed to the Sierra Club—Ozark Chapter. The organization was invited to submit comments on the updated statement. The revised draft EIS was submitted to CEQ on June 4. The final fully coordinated EIS is presently scheduled for submission to CEQ in September 1973.

The plan for the development of the Meramec Basin and the construction of Meramec Park Lake approved in the Flood Control Act of 1966 were entirely different from earlier studies. The authorized project is the result of a recent comprehensive basin study completed in 1965. The Meramec Park Lake project was modified by the addition of the new project purposes, of recreation, fish and wildlife, water supply and low-flow augmentation in the interest of water quality. The plan for the development of the Meramec Basin is a living dynamic plan; it is flexible and can be varied to meet the basin needs.

CRAWFORD COUNTY ACREAGE DESIGNATED FOR RECREATION PURPOSES

Senator BIBLE. Mr. Orville L. Burnett of Bourbon, Mo., presiding judge of Crawford County, Mo., in his statement of May 22, 1973, contends that he can see no need for Meramec Park Lake, that there are now 50,000 acres of land in Crawford County designated for rec-

reation purposes and that the project would destroy several thousand acres of fertile farm land. What is your answer to this?

Colonel EDGAR. Mr. Chairman, the need for Meramec Park Lake was explained in detail last year. We pointed out that among the basic objectives in the St. Louis area is to help satisfy a specific deficiency in urgently needed water-related recreational facilities. Inherent in meeting this need is the trade-off required by the conversion of streams to lake shore.

The 50,000 acres referred to as being designed for recreation purposes are the Huzzah Wildlife Management Area which is maintained in the primitive state by the Missouri Department of Conservation and the Clark National Forest supervised by the U.S. Forest Service. There are less than 40 acres in both of these primitive areas that have been improved with recreation facilities. Both of these agencies have endorsed the construction of Meramec Park Lake. It is their view that the lake will enhance the agencies' holdings by providing a lakeshore and water-related recreation potential.

Approximately 12,380 acres of land currently devoted to agriculture will be lost. Approximately 8,900 acres of agricultural land will be inundated by the Meramec Park Lake and 3,480 acres of land adjacent to the reservoir and currently used for agricultural purposes will be purchased by the Corps of Engineers for public recreational use. Many of these agriculture lands are periodically lost to production by flooding of the Meramec River. Due to proximity to the St. Louis area a pattern of urbanization has been established in the project area. This will increase with time and agricultural lands will be converted to more intensive use, with or without the project.

Senator BIBLE. Mr. Orr has stated that low flow augmentation storage in the interest of water quality is not the proper method to achieve water quality. He contends water quality must be protected by proper sewage control. What is your response to this contention?

Colonel EDGAR. Mr. Chairman, it is conceded that the most effective means of achieving water quality is by providing adequate waste treatment at its source. The Clean Water Board of Missouri is endeavoring to accomplish this under laws recently enacted by the Missouri Legislature. In cases where adequate waste treatment cannot be provided because of the widespread nature of the pollutant, water quality is considered to be a Federal objective.

Under Section 102b of Public Law 92–500 the Corps of Engineers retains the authority to determine the need for and the value of storage for regulation of streamflow, other than for water quality, including but not limited to, navigation, salt water intrusion, recreation, esthetics, and fish and wildlife. Consequently, there will remain a requirement for storage in Meramec Park Lake in the interest of streamflow regulation.

FLOOD DAMAGE PREVENTION

Senator BIBLE. Mr. Paul M. Denk contends that this project will cost more than the presently estimated cost of $87,500,000 and that the need for flood control is caused by the floods on the Mississippi River that cause backwater to flood along the lower Meramec. It is his position that damage can be prevented by evacuation of the lower Meramec Flood plain and planning and zoning. Would you comment on this?

Colonel EDGAR. Mr. Chairman: The estimated cost of the Meramec Park Lake project as of July 1, 1972, is $87,500,000. Construction cost estimates are adjusted for price level increases each year. The longer the construction of a project is deferred, the greater its cost. The same is true of most project benefits. With passage of time the value of project purposes and benefits increase. Major Meramec River floods have occurred on the average of about once every 6 years. However, portions of the bottomlands have experienced flooding almost annually. The highest flood of record, August 1915, covered the entire valley from bluff to bluff. From 1930 to the present, the Meramec River Basin has experienced 24 damaging floods. In addition to the many thousands of acres of farmland, the towns of Fenton, Kirkwood, Times Beach, Valley Park, Pacific, Glencoe and Cedar Hill have experienced flooding. Recurrence of the 1915 flood under present conditions would cause damages estimated at approximately $8 million. Average annual flood damage under present conditions are estimated at approximately $2 million.

It is fortunate that a storm of the 1945 magnitude did not coincidently occur over the Meramec Basin at the time of our recent record flood on the Missouri and Mississippi Rivers. If this had happened, the flood on the lower and middle Meramec River would have assumed catastrophic proportions. It is to prevent such flood damages that the flood control impoundments are proposed for the Meramec River and its major tributaries.

ENDANGERED SPECIES OF MUSSEL

Senator BIBLE. Mr. George A. Karleskint, president, and Mr. Alan G. Gottleman, secretary of the Greater St. Louis Shell Club filed a joint statement with this subcommittee on May 22, 1973, concerning the Meramec Park Lake project and the construction of dams in the Meramec River Basin. These gentlemen stated their fears that dams such as that at Meramec Park Lake would destroy particular molluscan ecological niches and invertebrate life in the Meramec River Basin. What is your comment on their viewpoint?

Colonel EDGAR. Mr. Chairman, several rare mussels have been collected in the section of the Meramec River that will be impounded. These mussels will be eliminated from the lake area. The quality of the water released from the reservoir should assure that the mussel fauna downstream of the lake will not be adversely affected, nor should mussel species upstream from the reservoir be adversely affected. The Meramec Park Lake should not result in the extirpation of any rare or endangered species of mussel from the Meramec Basin.

Senator BIBLE. Mr. Herbert I. McLain, Jr., stated that 61 percent of the people who voted in a survey were opposed to the Meramec Park Lake project. What is your response to this statement?

Colonel EDGAR. This survey was conducted by the Sullivan, Mo., Independent News, a local free shoppers weekly paper of limited circulation. The survey was conducted during an intensive drive of the Sierra Club for local project opponent support in the area. This electioneering drive may have had an effect on the survey's results. Since 1960, public meetings have been held in the Meramec Basin by citizens groups in favor of planned development of the basin area. The Meramec Basin Association with a membership of over 1,000 has taken

the lead in representation of those in favor of the present plan for the development of the basin. The association is supported by numerous civic, labor, and sportsmen's organizations. Through the years, the Meramec Basin Association has spent over $800,000 in seeking the planned development of the Meramec Basin. Most of these funds were raised from small membership fees. This indicates the broad base of the long and enthusiastic support which the people of the basin and nearby areas have exhibited. State agencies, county, and town officials are overwhelmingly in favor of the proposed Meramec Basin projects. This is evidenced by the exhibits filed with and testimony before the various congressional appropriation committees. Practically every rural town in or adjacent to the Meramec Basin is seeking a new source of employment income from some industry that is being invited to the community for the benefit of its citizens. The rural towns are realistic in their efforts to improve the lot of small town residents and those of surrounding areas by trading off some aspects of the existing environments for improved economic and living conditions which the Meramec Basin projects will bring to their communities.

DIALOG WITH GOVERNMENT

Senator BIBLE. Mr. Duane W. Woltjen stated that "We have seldom been given adequate opportunity to have any in-depth dialog on this matter with our elected representatives or Government agencies." How do you respond to this statement?

Colonel EDGAR. Mr. Chairman, since 1960, a number of public meetings attended by Corps personnel have been held at various locations in the Meramec Basin by citizen groups concerned with development of the basin area. Two public hearings were held in conjunction with the development of a plan for the Comprehensive Basin Report from April 1961 and December 1963. In addition, since 1965, approximately 25 public information meetings have been held regarding the basin development plan, with approximately three specifically regarding Meramec Park Lake. General public notices of these public hearings and information meetings were given widespread coverage in all the local newspapers. Proponents and opponents have freely expressed their views and filed statements supporting their positions. The Meramec Park Lake, as presently formulated and authorized, was coordinated with and took into consideration the programs and view of 23 Federal and State agencies. The opinions of other quasi-public and private organizations were solicited and considered. Consequently, the plan for the development of the Meramec Basin, in general, and the Meramec Park Lake, in particular, was the product of professional planning effort and consensus of a broad spectrum of informed and affected citizens in the Meramec Valley and the St. Louis metropolitan area.

1969 CONGRESSIONAL INVESTIGATION

Senator BIBLE. He further stated that the results of a 1969 congressional investigation warrant terminating in project before further harm is done. Will you respond to this?

Colonel EDGAR. Mr. Chairman, this congressional investigation was made to review the land requirements of Meramec Park Lake. The

inquiry was directed specifically to the necessity of acquiring 3,650 acres of land for recreation purposes. Pursuant to the directive in Senate Report No. 91–528 a report was presented from the Corps in February 1970 during the 1971 budget hearings. After review of the report, authority was given to proceed with the acquisition of the 3,650 acres of recreational lands with the proviso that the Corps review and eliminate, to the extent feasible, acreage planned for acquisition under the blocking-out policy. As a result of this directive the project lands were reduced 1,240 acres to a total of 40,800 acres.

Senator BIBLE. Mr. Sam Orr contends that the Meramec Park Lake project will cause urban development and monstrous pollution. How do you respond to this contention?

Colonel EDGAR. Mr. Chairman, with Meramec Park Lake, economic expansion and population growth of the host area will probably be greater, but not substantially different from what would occur without the project. The magnitude of these changes will depend upon many interacting variables. The project area would become more dense in terms of residential and commercial development, but the difference could not be regarded as substantial. This latter statement is made in view of the fact that while Crawford County, the lake site, is growing in terms of population employment and diversification, it is void of some of the attributes required to take full advantage of the project. Long-run national trends may influence development in the project area. On a national scale, the trend has been directed toward shorter workweeks, greater per capita income and more leisure activities. This is expected to continue increasing the demand for good quality recreation sites and should encourage development in the project area.

The Clean Water Act of 1972, enacted by the Congress, ordered that all communities which discharge sewage into waterways must have secondary treatment plants by 1975. The Missouri Clean Water Commission is actively enforcing the State water quality standards established pursuant to the Federal legislation.

The control and treatment of sewage effluent discharges should assist developing areas to avoid some of the problems that have plagued older communities.

ALTERNATIVE TO DAM CONSTRUCTION

Senator BIBLE. Mr. Brent Blackwelder, Washington representative of the Environmental Policy Center, presented testimony before the Senate Appropriations Committee on 14 May 1973 and before the House Appropriations Committee on 22 May 1973 on the budget for water development projects. The testimony was also offered on behalf of the Sierra Club. Mr. Blackwelder contends that there is a sound sensible alternative, to construction of the Meramec Park Dam (Mo.), which would cost less money and which would protect precious natural resources for this and for future generations.

Colonel EDGAR. Mr. Chairman, detailed studies over an extended period failed to reveal an alternate plan or project which would affect the environment less and produce the same quantity of environmental, sociological, and economic benefits. This contention is supported by the cooperating agencies in their studies and analyses of conditions with and without the project. The Corps of Engineers will objectively re-

view and evaluate any such plans that may be provided as a result of the coordination of the environmental impact statement of this project.

Senator BIBLE. Mr. Blackwelder also opposed funding Meramec Park Lake on the grounds the project was inconsistent with recommendation of the National Water Commission Draft Report. Would you comment on this?

Colonel EDGAR. The allegation concerning project inconsistency with findings of the National Water Commission Draft Report is quite general, and does not state the specific grounds upon which the claim is based. No specific reference is made to any particular recommendation or finding of a voluminous study report which is, in any event, still in a draft stage. Under the circumstances, it is not possible to determine from Mr. Blackwelder's statement what specific portions of the report, may be relevant to the matter. Until such time as whatever recommendations in the final report are implemented in policy or law, there is no requirement for the Corps projects to be consistent with the Commission's findings.

MILL LAKE, MO.

Senator BIBLE. There is nothing in the budget, and local interests have requested $50,000. What is your capability on this project?

General MORRIS. Mr. Chairman, we do not have any capability pending the completion of a restudy of the Blue River Basin to determine economic feasibility.

MISSISSIPPI RIVER AGRICULTURAL AREA NO. 8 (ELSBERRY), MO.

Senator BIBLE. Budgetary reserve will be available in fiscal year 1974, but there was no budget request. The House committee has allowed $100,000 and local interests have requested $190,000. What is your capability on this project?

General MORRIS. Our capability on this project is $190,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $190,000?

General MORRIS. The additional amount would be used to advance preconstruction planning.

PATTONSBURG LAKE, MO.

Senator BIBLE. There is nothing in the budget, and local interests have requested $100,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $100,000 for preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Pattonsburg Lake, Missouri

Summarized Financial Data:

Estimated Total Appropriation Requirement		$ 133,000,000 1/
Future non-Federal Reimbursement	$ 22,800,000	
Estimated Federal Cost (Ultimate)		110,200,000
Estimated non-Federal Cost:		22,800,000
Reimbursement:		
Water Supply	5,900,000	
Recreation	16,900,000	
Total Estimated Project Cost		$133,000,000
Allocations to Date		0 1/
Balance to Complete		$133,000,000
Amount that could be used in FY 1974.		100,000 2/

1/ Excludes $50,000 General Investigation funds for restudy.

2/ Does not include funds for advance participation with State of Missouri for relocation of Interstate Highway I-35 and advance relocation of Pattonsburg town relocation, and which are budgeted as separate projects. Excludes costs of provisions to permit the future installation of power.

Authorization: Flood Control Act of 1965 (HD 241/89/1).

Location and Description: The dam will be located on the Grand River, about five miles upstream from Gallatin, in Daviess County, Missouri. The plan of improvement provides for construction of a dam about 103 feet high and 6,500 feet long to create a lake with a total storage capacity of 2,720,000 acre-feet for flood control, water quality control, water supply, recreation and fish and wildlife. The feasibility report on inclusion of power as a project purpose has been completed. Forwarding the report to the Office of the Secretary of the Army is dependent on completion of coordination with the State of Missouri.

Proposed Operations: The amount of $100,000 could be used for preconstruction planning.

Justification: The Grand River is a frequent and major contributor to floods on the Lower Missouri and the Mississippi Rivers. During the period from 1941 through 1972, total damages experienced in the basin amounted to $76,600,000. It is estimated that a recurrence of these floods under current prices and conditions would cause damages estimated at $133,500,000. The Pattonsburg Lake will control the runoff from 2,232 square miles of drainage area and operating in conjunction with other authorized projects in the Grand River Basin will provide protection to 133,200 acres within the basin. Pattonsburg Lake will also reduce flood crests on the lower Missouri and the Mississippi Rivers. The large conservation pool will make the project very attractive for outdoor recreation. The benefit-to-cost ratio is currently estimated to be 1.2 to 1.

The average annual benefits are listed below:
Current Estimate July 1972 base (100-year life)

Flood Control	$ 4,505,000
Water Quality	81,000
Water Supply	438,000
Fish and Wildlife	130,000
Recreation	3,447,000
TOTAL	$ 8,601,000

Remarks: The installation of power at the Pattonsburg project is well justified on the basis of the economics developed by the District Engineer. The Department of Interior has recommended against this installation of power because of marketing difficulties. The Chief of Engineers, after considering all aspects of the project, including marketing problems, concludes that power should be included as a project purpose.

OPPOSITION

Senator BIBLE. J. Larry Dowell, M.D. of Pattonsburg, Mo., and Arthur A. Benson II, attorney for "Save Our Soil, Inc." Pattonsburg, Mo., have testified before the subcommittee in opposition to further appropriations for continued planning of Pattonsburg Lake. Now that you have had an opportunity to review these statements, do you have any general comments?

Colonel MILLER. Yes, sir. The Pattonsburg Lake project, along with the other projects authorized in the Grand River basin, has a long history of deliberations by both the Public Works and Appropriations Committees. There has been opposition to the basin projects since before the early 1960's, mainly from people who would have to move from their homes. Many of the objections which have been brought up this year have been previously addressed, such as the class I and II lands that would be taken out of production. Because many of these issues have already been discussed in past testimony, I will not address these points unless you may have some specific questions.

ADVERSE IMPACT ON AGRICULTURAL ECONOMY

Senator BIBLE. J. Larry Dowell, M.D., of Pattonsburg, Mo., has stated that the authorized Pattonsburg Lake would have an adverse impact on the agricultural economy of the immediately surrounding area. Could you comment on that aspect of the project?

Colonel MILLER. A substantial reduction in acreage of farmland will occur, and this will result in relative reductions in agricultural activity within the immediate lake area. However, it is anticipated that other economic activity induced by the presence of the lake will more than make up for the lost agricultural base.

Senator BIBLE. Dr. Dowell disagrees with your computation of economic losses attributable to the project from lands being taken out of production. How do you feel about his allegation?

Colonel MILLER. Dr. Dowell is confusing net economic loss on land removed from production with the gross crop production on these lands. In an economic sense, a loss is incurred only when a commodity of value has been damaged or destroyed. In the case of crops in the field or in storage, a flood, insects, fire, or other cause, could damage or destroy these commodities and reduce or eliminate their value. Such an event would properly be defined as a loss. However, if the crops are not planted, and thus not grown, a loss, in our sense of the word, has not occurred. When agricultural land is bought and converted to another use, only the opportunity to plant and grow crops is lost. The labor, machinery, fertilizer and other similar capital costs are not lost because they are transferable for utilization elsewhere for agricultural production, or for some items, such as labor and monetary assets, other types of production. For example, a displaced farmer might open a new business rather than return to farming in another area.

The law requires Federal agencies, including the Corps, to pay the fair market value for lands acquired. The fair market value is the current market's measure of the productive value of the land. Use of the value of crops as a measure of the land's productivity is not valid because a very large share of the value of crops is attributable to the

labor and capital, other than land invested in the production of those crops.

In its benefit-cost analysis, the Corps, by use of interest rates, computes the opportunity cost of the land's share of agricultural production foregone. For the Pattonsburg Dam and Lake project, the 1972 value is $390,000, which represents the agricultural opportunity cost computed at 5 percent of the market value of the land minus the opportunity gained via the Federal project computed at 3¼ percent of the market value of the land, that is, the Federal project interest rate. Lands subject to lease are not included since such lands will be used for agricultural purposes.

LOW ESTIMATE OF COST OF LAND

Senator BIBLE. Dr. Dowell stated that the Corps planned to allow $185 per acre for purchase of land for the Pattonsburg Lake, and that the actual value should have been twice that high. He concludes from this that the annual cost stated for the project is understated because of this low estimate of cost. Is this an accurate presentation of the facts?

Colonel MILLER. The June 1972 Interim Review Report, which has not yet been submitted to Congress cites a value of $185 per acre for unimproved farmland, based on July 1971 price levels. This is an average value for all rural land to be acquired, both the good and the poor. The value used for updating the authorized project without power to 1972 price levels was $225 per acre, and with the booming value of farm products and inflation affecting land prices, I understand the 1973 value will be in the range of $275 per acre. The $185 per acre value was based on a survey of recent sales in the counties involved made during the spring of 1971. The Corps of Engineers considers it valid for price levels of that period. The entire economic analysis of the interim review report is based on price levels of mid–1971.

Senator BIBLE. Dr. Dowell testified that the seven lakes proposed by the Corps of Engineers for the Grand River basin would require purchase of 360,750 acres while providing effective flood control for only 241,089 acres. He referred to a Department of Agriculture report. How do you see this situation?

Colonel MILLER. This statement refers to the entire seven lake plan recommended in the June 1963 Survey Report which became part of House Document 89–241, on which the Pattonsburg Lake was authorized. The Department of Agriculture report of which he spoke is being included as part of an economic impact study which was requested by the Office of Management and Budget. The study area comprises 21 counties, six in Iowa and 15 in Missouri, which roughly correspond to the Grand River basin. The report does not consider additional protection provided along the Missouri and Mississippi Rivers downstream. This type of comparison would have greater validity if the lakes were single-purpose flood control projects, but all seven of the recommended projects were multiple-purpose projects. Pattonsburg Lake, as authorized, included water quality control and recreation, including fish and wildlife recreation in addition to flood control. To this, municipal and industrial water supply storage for future use has

been added at the request of the State of Missouri under provisions of the Water Supply Act of 1958, as amended. Hydroelectric power facilities were recommended in H.D. 89–246 but not authorized. Power facilities are again recommended in the June 1972 Interim Review Report which the Congress directed be made.

NATION LOSING GROUND ON REDUCING FLOOD DAMAGE

Senator BIBLE. Dr. Dowell indicates that the United States is losing ground on reducing flood damages after having spent $240 billion in 37 years. Isn't this an indication that you are not approaching the problem correctly?

Colonel MILLER. According to the review draft of the proposed report of the National Water Commission dated November 1, 1972, approximately $8 billion had been appropriated to the Corps of Engineers for flood control work since 1918, or one-thirtieth of the amount quoted by Dr. Dowell. Dr. Dowell then directs his statement toward flood plain management and zoning, together with watershed projects. Flood plain zoning would fit very nicely with the authorized Grand River basin flood control plan. The flood plain lands are now essentially rural in character and are projected to remain so through the 100-year economic evaluation period. Other tools to reduce flood losses, or the impact of flood losses, include flood insurance, levees, flood forecasting and warning systems, channel modifications in the interest of hydraulic efficiency, and floodwater impoundment reservoirs, of course.

Senator BIBLE. Dr. Dowell mentioned for illustration a possible alternative of purchasing the downstream lands planned to be protected. Have you investigated this?

Colonel MILLER. No, sir. This illustrates the tendency of Save Our Soil, Inc., and others, to think of the Pattonsburg Lake only as a project to protect downstream Grand River valley land from flooding. The project also provides an additional increment of flood control downstream along the Missouri and Mississippi Rivers, provides a substantial recreation lake with some fish and wildlife benefit, provides a source of future water supply for drought periods, and, if authorized by Congress, could provide an additional source of peaking hydroelectric power.

EXCESSIVE FLOOD LOSSES

Senator BIBLE. Dr. Dowell stated that flood losses in the Mississippi Valley, in Tennessee, and in Pennsylvania during the past year were excessive due to rainfall exceeding the capacity of protective work resulting in flood plain inundation. Would you care to comment on this problem as it relates to flood control aspects of the Pattonsburg Lake project?

Colonel MILLER. The Corps of Engineers works functioned as they were designed to in the Mississippi Valley floods this spring. The spillways along the Lower Mississippi River must occasionally be used to protect the cities downstream. This was provided for in the design. The Tennessee flooding was primarily within the area of jurisdiction of the Tennessee Valley Authority, and it would not be fair for me

to comment on the problems there without detailed consultation with TVA. The flooding in Pennsylvania last year will be analyzed for years; the Wilkes-Barre levees and floodwalls were designed to operate with an authorized system of upstream reservoirs. The levees and floodwalls were constructed because of the obvious immediate local need; however, the reservoirs were not built for various reasons including lack of local support. Building only part of a flood control system will not provide the anticipated level of protection. An adjacent river basin, tributary to the Ohio River, received rainfall and experienced runoff of similar magnitude. This basin's flood control reservoirs had been substantially completed and damage was held to a minimum.

PROPOSED PUMPBACK FACILITY

Senator BIBLE. Dr. Dowell states that power generation will amount to 100,000 kilowatt-hours per year, and that much has been made of the cleanness of hydroelectric power. He further states that this is not true of a pumpback facility such as is proposed at Pattonsburg Lake since the pumping energy must be obtained from fossil fueled plants at other locations. While we have not yet received your report on power, I would appreciate it if you would comment on this statement.

Colonel MILLER. First, a hydroelectric powerplant at the Pattonsburg Dam would be expected to operate for a great many years, probably well in excess of the 100-year period of economic evaluation. Some of the pumping energy required for a pumpback operation would be obtained from surplus hydroelectric energy being generated in other parts of the Southwestern Power Administration's system but, at least in the early years, most of it would undoubtedly come from fossil fueled plants. Later, we would anticipate that the pumping energy would come from major nuclear baseload plants. In any event, the project would average some 82 million kilowatt-hours per year generation and would require an average of 59 million kilowatt-hours of off-peak pumping energy to maintain its capability through the four critical summer months. It could produce 100,000 kilowatt-hours in 1 hour.

OVERSTATED RECREATION BENEFITS

Senator BIBLE. Both Dr. Dowell and Mr. Benson spoke of recreation benefits as being too high. Also, Mr. Benson stated that the Bureau of Outdoor Recreation is currently restudying its recreaton use estimate as used by the Corps and that it is widely believed that the recreational use estimates for the Patonburg Lake are substantially overstated. Would you comment?

Colonel MILLER. The recreation benefits are based on a report from the Bureau of Outdoor Recreation. From our experience on existing lakes in the Kansas City District, the attendance estimate provided by BOR would not seem excessive. Attendance at our Perry Lake, a 12,000-acre lake some 45 miles west-northwest of Kansas City and about 12 miles northeast of Topeka, has averaged over 2 million recreation days since its initial impoundment was completed. It is accessible over State and county roads which are well below today's standards. Pattonsburg Lake, with a 42,000-acre multipurpose pool and accessible from Kansas City and Des Moines by Interstate High-

way 35 and from St. Joseph by U.S. Highway 36 and I–35, should attract at least as many visitors. On the other hand, we, too, have heard rumors that BOR is reevaluating the project, but we have had no official word.

DECLINE OF ECONOMIC ACTIVITY NEAR PROJECTS

Senator BIBLE. Dr. Dowell quotes a report by Dr. Rex Campbell, of the University of Missouri, which is said to show that economic activity declines in the vicinity of lake projects after construction, compared to adjacent counties unaffected by the projects. Could you comment on this?

Colonel MILLER. We think Dr. Campbell's report is deficient in several respects; For example, he failed to take into consideration instances of unusual economic activity in adjacent counties. His selection of control counties is questionable for at least three reasons. First, for accurate comparisons, control counties and lake counties must have been really identical in population and types of economic activities before construction of the lakes. Dr. Campbell's control counties include Jefferson City in Cole County which, relative to lake county urban areas, is large and unique in that it contains State governmental activities. Also included is Fort Leonard Wood in Pulaski County which experienced a high degree of activity during the 1960–70 decade because of the Vietnam conflict. Second, a number of Dr. Campbell's control counties are actually lake counties such as Morgan County, which contains parts of Lake of the Ozarks and the resort communities of Gravois Mills and Laurie; Cedar County, which contains parts of Pomme de Terre and Stockton Lakes; Barry County, which contains part of Table Rock Lake; and Ozark County which contains parts of Bull Shoals and Norfolk Lakes. Third, Dr. Campbell states:

> Another contribution made by persons advocating such dams is that the lake will attract industry. This study found no evidence to support this statement.

It is noted that several of the control counties selected by Dr. Campbell are significantly influenced by the nearby lakes as follows:

In Jefferson City, Cole County, aluminum floating boat docks, dock bumpers, and rub rails are manufactured. In Lebanon, Laclede County, aluminum boats, two-wheel camping trailers, boat trailers, and camping trailer axles, tents, and fishing lures and flies are manufactured. Richland, Pulaski, and Laclede Counties, is a major producer of aluminum boats. In Bolivar, Polk County, pontoon boats are manufactured. In Monett, Barry County, fishing flies, jigs, and related products are manufactured. The recreational opportunities offered by the lakes can only be a favorable influence on such manufacturing activities.

Residents of the various control counties are frequent visitors to the lakes, and roadside service establishments within the control counties certainly benefit by the increased traffic in the form of additional retail sales and services performed.

Senator BIBLE. Dr. Dowell stated that the Corps of Engineers has refused to hold public meetings to explain the project and have not notified all of the people who are involved in the project. Would you comment on this?

Colonel MILLER. The Kansas City district engineer held a public meeting at Gallatin, Mo., on April 27, 1972, immediately prior to the completion of the Interim Review Report dated June 1972. District personnel have attended other meetings, including two organized by "Save Our Soil, Inc.," as invited observers. Meetings have been held with the Pattonsburg Town Corp. and the Pattonsburg governing body in Pattonsburg in connection with planning for advanced relocation of the town. Additional public meetings will be scheduled when planning for the lake project itself gets underway; however, this will require congressional appropriations to initiate planning.

RESPONSE TO MR. BENSON'S SUMMARY

Senator BIBLE. Mr. Benson summarized six reasons for not moving forward with the Pattonsburg Lake project. Would you please comment on these?

Colonel MILLER. Yes, sir, I will comment on all six of his points.

Point No. 1 suggests the application of nonstructural alternatives. The present agricultural use of the protected land in the Grand River Basin is the use which would be proposed in a flood plain management plan for frequently flooded land. This land is projected to remain agricultural throughout the 100-year period of economic analysis. The flood plain management assistance program is primarily aimed at urban or urbanizing areas and must be initiated by local interests. The flood insurance program is channeled toward residences and small businesses and has little application in rural areas.

Point No. 2 suggests the economic infeasibility of hydropower. The report on hydroelectric power has not yet been formally submitted to Congress. The report clearly shows that, compared to other likely sources of peaking power, the proposed power facilities are economically justifiable. Repayment within 50 years at the current Southwestern Power Administration rate structure remains a serious problem.

Point No. 3 suggests a current excess of flat water recreation. There are a number of large lakes to the south and west of Kansas City, but there are few such lakes located in northwest Missouri. The Long Branch Lake, near Macon, Mo., with 2,430 acres and the Smithville Lake immediately north of Kansas City with 8,040 acres are in initial stages of construction. The Thomas Hill Lake, also near Macon, Mo., is comparable in size to Long Branch Lake. It was constructed and is owned by the Associated Electric Co. Public access is administered by the Missouri Conservation Commission under a short term contract with the cooperative.

Point No. 4 addresses project impact on the agricultural economy locally. That portion of the local agricultural economic base which will be displaced will be replaced by a lake oriented economic base. This infusion of new capital into the region, including construction of the lake, construction of the new town of Pattonsburg, construction of lake-oriented homes, and the general recreational activity should more than replace the lost agricultural economic activity.

Point No. 5 addresses our cost estimates. Land costs are rising rapidly in the Pattonsburg vicinity. So are agricultural crop values, 1972 land values are reflected in the cost estimate used to evaluate the pro-

ject as testified to by the Missouri River division engineer this spring.

Point No. 6 is aimed at environmental impact. The project would replace a portion of the present diverse terrestrial environment and landscape with a lake and lakeshore environment of equal or greater diversity. The gently rolling hills would remain; only a portion of the valley and riverine environment would be replaced.

MISSOURI GOVERNOR ASKS REVIEW OF PROJECT

Senator BIBLE. Mr. Benson points out that Governor Bond of Missouri has asked for time to review the Pattonsburg project. In view of this, shouldn't you wait until next year and get the Governor's thoughts on the project?

Colonel MILLER. Govenor Bond's request was for a delay in processing the Pattonsburg Lake environmental impact statement to give his administration an opportunity to study the project and develop a policy with regard to the project. Mr. Marvin J. Nodiff has testified that the Governor hopes to complete his review by the end of August so that the I–35 work may not be delayed further. To withdraw a request for fiscal year 1974 funding of Interstate Highway 35 crossing participation with the State of Missouri would be to defer the interstate highway closure increment between Des Moines and Kansas City another year. The State highway commission's schedule is to let a contract on the construction of this job in January or February of 1974. Should the Governor decide to withdraw support from the project, there would still be time to cancel construction of the high-level crossing prior to entering into any contracts for field work.

Senator BIBLE. What is the status of the impact on the Grand River Basin referred to by Dr. Dowell and Mr. Benson?

Colonel MILLER. The report has been coordinated by the Office, Chief of Engineers, and will be forwarded to the Secretary of the Army soon.

HYDROPOWER ADDS ECONOMIC FEASIBILITY

Senator BIBLE. Mr. Benson noted in his statement that in August 1971, the Corps of Engineers was quoted in the press as stating that the Pattonsburg project was not economically feasible without the addition of hydropower. Is this an accurate statement?

Colonel MILLER. Sir, it is accurate to say that this appeared in the press. A meeting was held on 10 August 1971 in the Kansas City district office, which was attended by the news media. The reporters published a statement made at the meeting essentially in the manner stated by Mr. Benson. However, based on 1972 price levels, the authorized project, excluding hydropower benefits, would have a benefit-to-cost ratio of 1.17 to 1. Without power, of course, we would likely rescale the project prior to construction.

Senator BIBLE. Dr. Dowell stated that, according to a survey which was made by Save Our Soil, Inc., of which he is president, 72 percent of the townspeople in Pattonsburg opposed the project and only 8 percent favored it. Can you comment on this?

Colonel MILLER. I have no knowledge of this survey or the way it was determined.

Senator BIBLE. There is nothing in the budget, the House committee has allowed $80,000, and local interests have requested $80,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $80,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Perry County Drainage and Levee Districts Nos. 1, 2, and 3, Missouri

Summarized Financial Data:

Estimated Federal Cost		$3,070,000
Estimated Non-Federal Cost		28,000
Cash Contribution	$ 0	
Other	28,000	
Total Estimated Project Cost		$3,098,000
Allocations to Date		0
Balance to Complete		2,670,000
Amount that could be utilized in FY 1974		80,000

Authorization: 1946 Flood Control Act and Section 201 of the 1965 Flood Control Act (Authorized 12 October 1972).

Location and Description: Perry County Drainage and Levee Districts Nos. 1, 2 and 3 are located in Perry County, Missouri, and Randolph County, Illinois, on the right bank of the Mississippi River between river miles 95 and 111 above the mouth of the Ohio River. The districts are bounded on the north by the old Mississippi River channel, by the Mississippi River on the east and south, and by a diversion channel at the base of the bluffs on the west. There are 26,881 acres of bottom lands within the districts. Drainage from about 30 acres of hill land is tributary to the upstream end of the districts. The districts are protected by a common levee system. The proposed plan of improvement provides for the construction of four pumping stations having the following capacities: 100 cfs for the Bois Brule drainage area; 60 cfs for the Missouri Chute drainage area; 130 cfs for the Cinque Hommes drainage area; and 115 cfs for the Jones Cutoff drainage area. In addition, approximately 13,900 feet of new diversion ditches will be required.

Proposed Operation: The amount of $80,000 would be used to initiate preconstruction planning.

Justification: While a substantial degree of protection against direct flooding by the Mississippi River has been provided to the districts from the levee project, the problem of disposal of impounded water remains. The most extensive flooding occurs when runoff is blocked by the Mississippi River stages. Short duration impoundment is occasionally experienced at times of low river stages when runoff from intense rainfall exceeds the capacity in the vicinity of the outlet structures and spreads to areas adjacent to the drainage channels. Under extreme flood conditions, about 46 percent of the land in the districts is subject to flooding from impounded waters. The benefit-cost ratio is 1.4 to 1. The average annual benefits, all flood control, are presently estimated at $387,000.

Smithville Lake, Mo.

Senator Bible. The budget request was $1,700,000. The House committee has allowed $4 million, and local interests have requested $4 million. What is your capability on this project?

General Morris. Our capability on this project is $4 million, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $2,300,000?

General Morris. The additional amount would be used for land acquisition and for the embankment and outlet works. Project completion date would be advanced 3 months to December 1977.

Frazier-Wolf Point Bank Stabilization, Mont.

Senator Bible. There is nothing in the budget, the House committee has allowed $25,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $25,000 to initiate and complete preconstruction planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Frazer-Wolf Point Bank Stabilization, Montana

Summarized Financial Data:

Estimated Federal Cost	$ 365,000
Estimated non-Federal Cost	0
Total Estimated Project Cost	$ 365,000
Allocations to Date	0
Balance to Complete	$ 365,000
Amount that could be used in FY 1974	$ 25,000

Authorization: River Basin Monetary Authorization Act of 1971 (P.L. 92-222).

Location and Description: The project is located along the Missouri River approximately 4 miles southeast of Frazer, Montana. The project consists of 960 linear feet of stone fill dike construction on the right bank and 2200 linear feet of segmented bank protection on the left bank. The project limits extend from about .25 mile upstream to .50 mile downstream of the Frazer- Wolf Point Irrigation Unit intake structure.

Proposed Operations: The amount of $25,000 would be used to initiate and complete preconstruction planning.

Justification: Channel rectification structures along the right bank, upstream of the intake area, are necessary to correct shoaling conditions at the intake which is owned by the Bureau of Indian Affairs and provides water for a 12,300 acre irrigation district. Bank erosion protection structures along the left bank, downstream from the intake are necessary to prevent serious bank erosion that will result from forcing the channel flow into the intake area. Adverse shoaling conditions are continuing to increase. The water intake capacity is being increased to provide water to an additional 5,350 acres, for a total 17,650 acres. The proposed plan will furnish a sufficient water supply to the intake area allowing the irrigation unit to meet its output requirements.

Libby Additional Units and Reregulating Dam, Mont.

Senator Bible. The budget request was $400,000. The House committee has allowed $400,000, and local interests have requested $700,000. What is your capability on this project?

General Morris. Our capability on this project is $400,000, the same as the budget, Mr. Chairman.

Papillion Creek and Tributaries, Nebr.

Senator Bible. The budget request was $3,500,000. The House committee has allowed $5,200,000, and local interests have requested $5,500,000. What is our capability on this project?

General Morris. Our capability on this project is $5,500,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $2 million?

General Morris. The additional amount would be used to acquire lands which are subject to price escalation, for site 20. Project completion date would not be affected.

Corson Inlet and Ludlam Beach, N.J.

Senator Bible. There is nothing in the budget, and local interests have requested $260,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $65,000 to initiate preconstruction planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Corson Inlet and Ludlam Beach, New Jersey

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$6,190,000
Estimated non-Federal Cost		6,710,000
Cash Contribution	$6,710,000	
Other Costs	0	
Total Estimated Project Cost		12,900,000
Allocations to Date		0
Balance to Complete (Corps of Engineers		6,190,000
Amount that could be used in FY 1974		65,000

Authorization: December 1970 under provision of Section 201 of Flood Control Act of 1965.

Location and Description. The project is located in Cape May County, New Jersey and extends from the northerly side of Corsons Inlet in a southwesterly direction to the northerly side of Townsends Inlet. The plan of improvement consists of 12' X 300' inlet channel with 6' X 100' interior channel; inlet jetties; deposition basin; bulkhead and backfill; appurtenant works for jetty and bulkhead fishing; beach fill; removal or cutting off existing timber piling; ten additional groins and periodic bench nourishment.

Proposed Operations: The $65,000 would be used to initiate (1) contacts and coordination with other interested Governmental (Federal, State and local) and private agencies; (2) Topographic surveys; (3) subsurfocs explorations (4) initiate Phase I GDM; (5) initiate, updating EIS.

Justification: This project will achieve tangible benefits by providing (1) improved and safer navigation through Corsons Inlet; (2) preservation of beaches with consequent increased recreation usage and reduction of storm damages; (3) land enhancement; (4) increased fishing opportunities. The benefit cost ratio is 1.2 to 1. The total annual benefits for the project are broken down as follows:

Average Annual Benefits

Beach Erosion Control	$1,519,000
Navigation	370,000
Jetty Sport Fishing	23,000
Total Benefits	$1,912,000

COCHITI LAKE, N. MEX.

Senator BIBLE. The budget request was $16,400,000. The House has included $16,400,000, and local interests have requested $18,000.000. What is your capability on this project?

General MORRIS. Our capability on this project is $18,000,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $1,600,000?

General MORRIS. The additional amount would be used to advance dam construction and to initiate recreation facilities.

EAST RIVER (SPUR CHANNEL TO ASTORIA WATERFRONT), N.Y.

Senator BIBLE. There is nothing in the budget, the House committee has allowed $100,000, and local interests have requested $500,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $100,000 to initiate construction.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: East River (Spur Channel to Astoria Waterfront), New York

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)	$3,260,000
Estimated non-Federal Cost	0
Total Estimated Project Cost	3,260,000
Allocations to date	60,000
Balance to Complete (Corps of Engineers)	3,200,000
Amount that could be used in FY 1974	100,000

Authorization: Section 201 of Flood Control Act of 1965. Senate Public works Committee 17 December 1970 Resolution. House Public Works Committee 15 December 1970 Resolution.

Location and Description: The project extends from that leg of the East River Channel skirting the south shore of the Bronx to the Astoria (Queens) waterfront, in Bronx and Queens Counties. The project will improve the South Brother Island Channel by constructing a flare entrance channel, tapering from a width of 1,600 feet at the East River Channel to 400 feet in about 0.3 mile, thence a channel 400 feet wide for 0.6 mile, and a turning basin 1,000 feet wide and 1,600 feet long at Astoria waterfront; all to depth of 37 feet in rock and 35 feet in other materials.

Proposed Operations: The amount of $100,000 would be used to initiate construction.

Justification: The East River is an important waterway of New York Harbor. The tributary area served by this project comprises the Borough of Queens, New York City, with a population of 1,986,000 in 1970. Residual and distillate fuel oils consumed locally for industrial and residential purposes, are the principal commodities of commerce on the spur channel and are transported primarily by deep-draft tankers. Receipts of petroleum products are estimated at 2,187,000 tons in 1971. Benefits would accrue from elimination or reduction of lightering of tankers using the project. Average annual benefits are estimated at $348,000. The benefit-cost ratio is 1.7 to 1.

East Rockaway Inlet to Rockaway Inlet and Jamaica Bay, N.Y.

Senator Bible. The budget request was $175,000 to continue planning. The House committee allowed $175,000, and local interests have requested $5,000,000. What is your capability on this project?

General Morris. Our capability on this project is $175,000, Mr. Chairman, the same as the budget. Local interests have requested that the project proceed at the time on the basis of beach erosion control only since deterioration of the beach has reached alarming proportions and the hurricane protection segment of the project will take several more years to plan. An evaluation of the local request is now being made to determine the feasibility of proceeding with the beach erosion work only and whether further congressional authorization is needed. Assuming that we will proceed with planning of the beach erosion work in fiscal year 1974, we would not have a construction capability in fiscal year 1974.

Fire Island Inlet to Jones Inlet, N.Y.

Senator Bible. There is nothing in the budget, and local interests have requested $1,445,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $1,445,000 to continue construction.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Fire Island Inlet to Jones Inlet, New York

Summarized Financial Data:

Estimated Federal Cost		$ 21,300,000
Estimated non-Federal Cost		13,900,000
Cash Contribution	13,880,000	
Other Costs	20,000	
Total Estimated Cost		35,200,000
Allocations to date		1,807,000
Amount that could be used in FY 1974		1,445,000

Authorization: 1962 River and Harbor Act

Location and Description: The Fire Island Inlet to Jones Inlet beach erosion control project is located in Nassau and Suffolk counties on the south shore of Long Island. The project is contiguous to Fire Island State Park and Gilgo State Park. The dual-purpose project would assure the stability of the public beaches and the inlet navigation channel.

Proposed Operations: The amount of $1,445,000 would be used to continue construction, contingent upon receipt of $980,000 of local funds.

Justification: The ocean shore from Fire Island Inlet westerly to Jones Inlet has been eroding along most of its 15 mile length. Experience with the existing navigation project for Fire Island Inlet and the existing beach erosion control project for the shore between Fire Island Inlet and Jones Inlet discloses that a unified dual-purpose project is urgently needed to assure stability of the shore and of the inlet channel. Without nourishment, the publicly owned beaches in this area will continue to recede, eventually resulting in substantial destruction of shore development at Jones Beach. The Inlet is used extensively by commercial and recreational craft. Annual commerce carried on the waterway consisting mainly of petroleum products and fish in 1971 totalled 143,000 tons. About 10,000,000 people from many states visit the area annually, and there is great demand for recreational facilities along the ocean beach from Fire Island Inlet to Jones Inlet. Average annual benefits are estimated at $4,734,000 The benefit-to-cost ratio is 1.4 to 1.

YONKERS (SAWMILL RIVER), N.Y.

Senator BIBLE. There is nothing in the budget, the House committee has allowed $200,000, and local interests have requested $200,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $200,000 to initiate construction.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Yonkers, (Sawmill River), New York

Summarized Financial Data:

Estimated Federal Cost	$ 7,600,000
Estimated non-Federal Cost	1,050,000
Cash Contribution 0	
Other Costs $ 1,050,000	
Total Estimated Project Cost	$ 8,650,000
Allocations to date	250,000
Amount that could be used in FY 1974	200,000

Authorization: 1965 Flood Control Act.

Location and Description: The project is located on Sawmill River in Yonkers, N.Y. (Westchester County) starting about one mile upstream from junction of Sawmill and Hudson Rivers. The authorized plan consists of about 3,800 feet of concrete flume, clearing and enlarging channels 5,700 feet in other reaches, about 5,400 feet of floodwals, a closure structure, and various interior drainage facilities, and modification or reconstruction of nine bridges. At the request of local interests, alternatives consisting of tunnel diversion plans are being considered in preconstruction planning.

Proposed Operations: The amount of $200,000 would be used to initiate construction in the upstream reach.

Justification: Flooding by the Sawmill River is commonplace. The largest flood of record at Yonkers occurred in October 1955, inundating approximately 76 acres resulting in damages estimated at $1,500,000 (March 1964 price level). Other serious floods occurred in March 1936, September 1938 (causing damages comparable to the 1955 flood), and June 1972. Since 1927, local interests have spent over $500,000 to improve and realign the channel. The benefit-cost ratio is 1.07 to 1. Average annual benefits are estimated at $328,000.

Atlantic Intracoastal Waterway—Replacement of Federal Highway Bridges, N.C.

Senator Bible. The budget request was $150,000 and local interests have requested $550,000. What is your capability on this project?

General Morris. Our capability on this project is $550,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $400,000?

General Morris. The additional amount would be used to initiate bridge site land acquisition and construction of the Wilkerson Creek Bridge.

Carolina Beach and Vicinity, N.C.

Senator Bible. There is nothing in the budget and local interests have requested $1,190,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $1,190,000 to continue construction.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Carolina Beach and Vicinity, N.C.

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$ 5,100,000 1/
Estimated non-Federal Cost		$ 4,440,000
Cash Contribution	$ 2,510,000	
Other Costs	$ 1,930,000	
Total Estimated Project Cost		$ 9,540,000
Allocations to Date		$ 1,404,000
Balance to Complete (Corps of Engineers)		$ 3,696,000
Amount that could be used in FY 1974		$ 1,190,000

1/ Includes $ 960,000 for 10-year beach nourishment

Authorization: Flood Control Act of 1962.

Location & Description: The project is located in New Hanover County, about 15 miles southeast of Wilmington, North Carolina, on the peninsula which separates the lower Cape Fear River from the Atlantic Ocean.

The project consists of two segments as follows:

Carolina Beach - Construction of a dune with a base generally bordering at, or near, the building line with a crown width of 25 feet at an elevation of 15 feet above mean-low-water, together with integral construction of a beach berm, with a crown width of 50 feet at elevation 12, extending about 13,500 feet from the northern to the southern limits of Carolina Beach; initial deposition of sufficient suitable material north of Carolina Beach to serve as a feeder beach; and Federal participation in the cost of beach nourishment for a period not to exceed 10 years from year of initial placement.

South of Carolina Beach - Construction of a dune with a base generally bordering at, or near, the building line with a crown width of 25 feet at an elevation of 15 feet above mean-low-water, together with integral construction of a storm berm having a crown width of 50 feet at elevation 12 and a temporary normal berm with a crown width of 50 feet at elevation 9, extending about 17,800 feet from the southern limits of Carolina Beach to a point about 4,150 feet south of the southern limits of Kure Beach, including a transition section 2,600 feet long at the south end; and Federal participation in the cost of beach nourishment for a period not to exceed 10 years from year of initial placement.

Proposed Operations: Complete berm and dune construction for Carolina Beach portion of project.

Justification: The project would provide both shore protection and hurricane flood protection. Areas from Carolina Beach to Kure Beach experienced heavy losses in the hurricanes of 1944, 1954, 1955, and 1958. It is estimated that recurrence of those hurricanes would cause damages of $11,837,000 based on January 1960 prices. The improvement will prevent or reduce damages to the beach and property along the beach by providing full shore protection and partial hurricane-flood protection from hurricanes of equal or less intensity than that of Hurricane Hazel, provide an increased area for recreational use, and increase value and earning power for shore-front and other property in the affected communities. The benefit-cost ratio is 1.06 to 1. The average annual benefits are broken down as follows:

Annual Benefits		
Flood Control	$347,000	
Recreation	216,500	
Navigation	26,500	1/ 2/
Total Benefits	590,700	1/

1/ Until navigation study of Carolina Beach Inlet is completed (tentatively scheduled for FY 1975), navigation benefits associated with project are not known, therefore, the benefits for the Carolina Beach portion are incomplete.

2/ Includes savings from disposal of dredged material - material from Carolina Beach Inlet to be pumped onto beach rather than to more distant disposal area.

Falls Lake, N.C.

Senator Bible. Budgetary reserve funds in the amount of $3,459,000 will be available in fiscal year 1974, but there was no budget request. Local interests have requested $2 million. What is your capability on this project?

General Morris. Our capability on this project is $2 million, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $2 million?

General Morris. The additional amount would be used to continue construction. It would advance completion of the project 10 months.

OPPOSITION

Senator Bible. We have heard testimony on behalf of the Neuse Valley Association that the Congress not appropriate funds for the Falls Lake project. They gave the following seven reasons to deny funding:

1. The water in the proposed lake will be poor quality and large portions of the lake will be unsuitable for recreation.
2. The project will cause the loss of over $2 million per year in farm income.
3. The project will seriously and adversely affect wildlife, including certain rare and endangered species.
4. The flat water recreation facilities to be provided by the project are not needed.
5. The water supply benefits of the project can be achieved by other means at lower cost.
6. The project is unnecessarily expensive.
7. The Corps of Engineers has failed to file a legally sufficient environmental impact statement.

Would you comment.

WATER QUALITY

Colonel Irving. Yes, sir. We feel that the project is fully justified. I would like to address each reason, in turn. First, water quality.

Preimpoundment studies to determine the quality of impounded waters is a prerequisite for all Federal reservoirs. A preimpoundment study of water quality of the Falls Lake Reservoir was undertaken by contract with the School of Environmental Sciences, University of North Carolina at Chapel Hill in March 1972 with Dr. Charles M. Weiss and Dr. Donald Francisco as principal investigators. The summary of the report states in part:

> The existing water quality characterization by all physical, chemical, microbiological, and benthic parameters shows no unusual substances or materials, or environmental distortions which would create conditions making the proposed impoundment unsuitable for water supply or recreational uses. It would be expected that to optimize water quality for both purposes, the levels of treatment at Durham North Side and Butner would be improved to remove phosphorus up to about 90% of the total quantity present. Control of non-point source discharges might be effectively regulated or reduced through controlled recreational development around the periphery of the lake as agricultural land reverts to forest or other purposes which would provide for more stable soil structure.

The findings of the report were based on extensive field studies and data collection at 11 stations within the project area. The conclusions drawn in the Environmental Protection Agency report, quoted by Mr. Spearman, were based on national averages and not on local conditions.

LOSS OF FARM INCOME

With regard to loss of productive farmland, the "over $2 million per year" loss figure was apparently derived by the North Carolina Farm Bureau Federation (NCFBF) which commented on the Corps' environmental impact statement for the Falls Lake project.

The "over $2 million per year" loss figure was taken from these comments, possibly without knowledge as to how the figure was computed.

The $2 million loss was derived as follows:

The NCFBF treated the counties of Wake, Durham, and Granville as individual farm units and computed average receipts per acre for each county. These receipts for Wake, Durham, and Granville Counties were computed to be $64.40, $27.40, and $57 per acre, respectively. These amounts were then applied to the 18,500 acres of project lands in Wake County, the 18,500 acres in Durham County, and the 6,000 acres in Granville County, disregarding completely the actual land uses within the project area.

Thus, the "over $2 million loss" was computed from these figures as follows:

County	Acres	Average per acre-value	Claimed loss
Wake	18,500	$64.40	$1,191,400
Durham	18,500	27.40	506,900
Granville	6,000	57.00	342,000
Total			2,040,300

CROPLAND

Of the approximate 42,500 acres of land required for the project, only 3,000 acres, or 7 percent, is actual cropland. An additional 750 acres, or 2 percent, of total project lands can be considered as potential agricultural cropland. The remaining 91 percent is forested.

The potential annual loss of gross receipts from timber harvest and other forest products within the project area was computed to be $79,000 based on statistics supplied by the NCFBF.

The corps, however, compensates landowners for marketable timber located on project lands, or landowners are given the opportunity to harvest the timber themselves. The Corps prefers to pay for the marketable timber in order to preserve the natural quality of the land in recreational areas. Either way, the owners are compensated for income lost and the loss becomes a project cost and is included in the cost of project lands.

Of the 3,000 acres of project lands presently in crops, only 50 acres are planted in tobacco. Based on NCFBF statistics, the crop value per acre for tobacco is about $1,400. Thus, the annual loss in gross receipts from this tobacco crop is about $70,000.

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The remaining 2,950 acres of cropland, plus the 750 acres of potential cropland has a weighed per-acre value of $41.35, based on statistics furnished by the NCFBF. The total annual loss in gross receipts from this cropland, other than tobacco, is estimated at $153,000 (3,700×$41.35=$152,995).

Thus, the total potential loss of gross receipts from all field crops is estimated at $223,000—not the "over $2 million" stated.

Assuming a 20-percent return on investment—which is high—the loss in annual net incomes to farmers before taxes in the project area is estimated at $45,000.

Included in the Corps' analysis of annual project costs, however, is $132,000 which is the computed annual loss of income attributed to project lands.

The allegation that there will be damage to wildlife and endangered species can be answered as follows:

The Falls Lake project consists of 42,259 acres, of which only 12,490 acres will be permanently inundated. The remaining 30,000 acres, more or less, will be managed for wildlife preservation. Acquisition of the 42,259 acres for project purposes will insure the establishment and preservation of a greenbelt area, free from steadily mounting urban pressures. The Research Triangle Sierra Club has stated that wildlife in the 63,000 acres located in the floodplain downstream of the dam will be adversely affected by reduced overbank flooding. Based on observations of the floodplain below the dams on the Roanoke River in a similar area, wildlife has flourished as a result of reduced overbank flooding.

ENDANGERED SPECIES

At the time the environmental impact statement was filed (1971), the four rare and endangered species mentioned by Mr. Spearman were not listed in "Threatened Wildlife of the U.S.," published by the U.S. Department of the Interior, Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife. Information collected to date contains conflicting information as to the distribution and status of these species. Our biologists are continuing the search for additional information pertaining to project impact on these species and the incurrence and value of these species.

FLAT WATER RECREATION FACILITIES

There is a definite need for flat water recreation facilities.

In accordance with national statistics, as compiled in a survey of outdoor recreation activities by the Alliance for North Carolina State Parks, the State of North Carolina ranks: 12th in the Nation in 1970 population; 36th in the Nation in total acres developed in parks; 46th in the Nation in per capita expenditures for recreational land and development; 50th in the Nation in recreational acreage per capita; and, 50th in the Nation in dollars spent on land acquisition for recreational purposes.

This indicated-need for recreational facilities within the State of North Carolina is further evidenced by the 300 percent increase in visitation of existing recreation lands in North Carolina within the last 15 years. The State of North Carolina recognizes the need for

additional recreation lands as evidenced by the 1973 North Carolina legislative appropriation of approximately $11.5 million to acquire State park lands.

The provision of "flat water recreation" facilities is an excellent means of satisfying outdoor recreation needs as indicated by a comparison of 1972 visitation rates experienced on 2,400 acres of leased recreation lands in North Carolina adjacent to the John H. Kerr Reservoir, and approximately 50,000 acres of other North Carolina State park lands. This comparison indicates that the visitation rate on the reservoir associated lands was about 340 visitors per acre, while the rate at the other State park recreational areas was only 60 visitors per acre.

WATER SUPPLY

The water supply benefits cannot be achieved at lower cost. The Falls Lake project provides a dependable regional water supply of over 100 million gallons per day to the city of Raleigh and its environs. The Falls Lake provides over 45,000 acre-feet of water supply storage in a region which will need over 110,000 acre-feet of water supply storage by the year 2020.

Alternative systems for Raleigh alone must be capable of yielding 100 million gallons per day in order to be compared meaningfully. The Corps, the State of North Carolina, and the city of Raleigh have all investigated alternative water supply sources. A summary of the investigations by the North Carolina State Board of Health is given below as extracted from a letter dated April 13, 1973, to the Wilmington District Engineer.

(1) During periods of low streamflow in the area, the water supply for the city of Raleigh becomes critical. The Swift Creek-Walnut Creek watersheds have a dependable yield of only 14 MGD. The Neuse River is also a major source of raw water for the city, providing up to MGD; however, during periods of low flow only 6 MGD is available from the river. These sources are supplemented by the release of 5 MGD of water from Lake Butner on Knapp of Reads Creek through a contractual agreement with the North Carolina Board of Mental Health. This agreement has recently been extended until December 31, 1977. In periods of drought, such as those which occurred a few years ago, the availability of sufficient raw water for the City of Raleigh could create an extremely critical situation. As regards the yield of the Swift Creek-Walnut Creek watersheds, it should be noted that increasing development of this area may be expected to reduce the yield of these watersheds in both quality and quantity. The rate of degradation will, of course, depend upon the rate of development, but it is not reasonable to assume that the present 14 MGD yield will last indefinitely, especially if land development is not curtailed.

(2) Engineering studies of the most feasible approach to Wake County's water supply and wastewater problems were completed in 1971, and a report titled, "Wake County Water and Waste Water Study," has been accepted in principle by city and county officials. This report outlined and recommended a regional water system concept which would encompass Wake County and portions of adjoining counties, with the city of Raleigh supplying finished water to various municipal and county distribution systems.

(3) In acceptance of the proposed regional concept, the following units of government have submitted applications for State grant funds, or have indicated an intent to submit applications for such grants, for the purpose of installing, improving or extending their respective water distribution systems utilizing finished water from the City of Raleigh as the source of supply: Town of Gary, Town of Garner, Town of Apex, Town of Knightdale, Town of Fuquay-Varina, and the County of Wake.

This regional approach in predicated on the availability in the not too distant future of a raw water supply of 100 MGD from the Falls Lake project.

ALTERNATIVES

(4) Several possible alternative courses of action have been explored or suggested should the Falls Lake project not be constructed, or should be delayed for an appreciable period of time. These are set forth below and we believe reference to these alternatives should be included in the updated statement.

(*a*) The City of Raleigh is considering construction of an impoundment on Beaver Dam Creek, a tributary of the Neuse River, the proposed impoundment would provide a safe yield of 16 MGD which would be adequate only until 1981–82. By adding 10 feet in height to the proposed dam at a future date, the safe yield could be increased to 23 MGD, which would be adequate only until 1986–87, at which time the Neuse River would have to be impounded. The Beaver Dam Creek impoundment can, thus, only be considered as a temporary solution.

(*b*) Consideration has also been given to obtaining water from the New Hope Lake on which, as you know, construction may be delayed by court action. However, it is considered that this proposal is not economically feasible because of the distance the raw water would have to be pumped (approximately 33 miles), and the excessive pumping costs involved.

(*c*) Feasibility studies are now in progress for construction of a dam on the Flat River in Durham County as a joint venture between the Cities of Raleigh and Durham. It is doubtful that this proposal will be implemented, since much local opposition has already been expressed and has resulted in eliminating from consideration a previously proposed dam site. Again, even if this project were constructed, it would be only a temporary measure.

(*d*) If the Falls Lake project is not constructed, the City of Raleigh may have no other feasible alternative than to proceed with construction of a dam on the Neuse River which will provide for its water supply requirements of 100 MGD, plus such additional storage as may be required for low-flow stream augmentation.

COSTS

Colonel IRVING. Insofar as costs to be incurred by the city of Raleigh to obtain an additional water supply source, the following data are furnished:

Project	Storage required (acre-feet)	Water supply yield (million gallons per day)	Cost (millions)
Beaver Dam Creek	23,200	16	$5.9
Little River in Durham County	47,000	34	9.0
Little River in Wake County	11,000	10	3.9
Single purpose water supply project at falls site	[1] 104,000	100	22.0
Presently authorized multiple-purpose project at falls site with water supply storage	45,000	100	4.1

[1] Includes 51,000 acre-feet for water supply, 15,000 acre-feet to maintain minimum streamflow, and 38,000 acre-feet of sediment storage.

The Falls Lake project has been planned in the best tradition of the multiuse concept to satisfy regional objectives.

PROJECT COST

The project is not unduly expensive.

The estimated project cost of $49 million is not the proper basis for determining whether the project is unnecessarily expensive. The measure of economic project worth from a national standpoint is represented by the project benefit-cost ratio, which is a very favorable 1.4 to 1.0 ratio indicating a 40-percent margin of benefits over costs.

The project is located between the cities of Raleigh and Durham, N.C., and in fact some of the required project lands, or separable recreation lands, are located within the city limits of Durham.

Pressure from urban expansion is presently having great effect on land prices within the project area. The Corps has compiled substantial evidence that much of the price increases are due to land speculation and land development by private speculators and developers. Developers are subdividing lands within the project boundaries; many wooded areas are being stripped; and in some cases proposed project lands are being used as trash dumps.

The Falls Lake project offers the Federal Government and State government the opportunity to establish a 42,500-acre green-space within the rapidly emerging megalopolis of Raleigh, Durham, and Chapel Hill. Without the project, the evidence points to a monotonous expanse of subdivisions within the project area. In this respect, the price for preserving green space for future generations appears to be small.

ENVIRONMENTAL IMPACT STATEMENT

With regard to the environmental statement, the Falls Lake environmental statement was prepared in early 1970, even before the Council on Environmental Quality issued guidelines. That EIS was acceptable at that time and filed with the Council on Environmental Quality on April 15, 1971. Nevertheless, in accordance with Corps of Engineers regulations, the EIS will be updated. The updated statement will include information gathered by our staff and consultants relating to water quality conditions and botanical elements, the EPA water quality report, and other pertinent information. The updated draft statement is scheduled to be completed in August 1973, coordinated with all concerned agencies and the final statement is scheduled for submission to CEQ in November 1973.

MANTEO (SHALLOWBAG) BAY, N.C.

Senator BIBLE. There is nothing in the budget, the House committee has allowed $60,000, and local interests have requested $60,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $60,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Manteo (Shallowbag) Bay, North Carolina

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$16,500,000
Estimated Federal Cost (U. S. Coast Guard)		30,000
Estimated non-Federal Cost		635,000
Cash Contribution	$ 0	
Other Costs	635,000	
Total Estimated Project Cost		17,165,000
Allocations to date		0
Balance to Complete (Corps of Engineers)		16,530,000
Amount that could be used in FY 1974		60,000

Authorization: 1970 River and Harbor Act.

Location and Description: The project is located along the outer banks portion of Dare County, N. C., between Oregon Inlet, Roanoke Island, and Albemarle Sound. The proposed modification provides for stabilization of Oregon Inlet with a dual rubble-mound jetty system, including means for sand transfer to the downdrift beach and bottom protection for the highway bridge over Oregon Inlet; a channel 20 feet deep and 400 feet wide through the ocean bar at Oregon Inlet; a channel 14 feet deep and 120 feet wide from the gorge in Oregon Inlet to and through Roanoke Sound to and including a 15-acre basin of the same depth at Wanchese; and a channel 10 feet deep and 100 feet wide from the 12-foot-deep channel in Manteo (Shallowbag) Bay through Roanoke Sound to and through Albemarle Sound to deep water near the northern end of Croatan Sound.

Proposed Operations: The $60,000 could be used to initiate preconstruction planning.

Justification: Oregon Inlet is the only navigation opening through the barrier reef between Cape Hatteras, North Carolina, and Cape Henry, Virginia, that affords access to inside protected waters and to nearby markets and supplies for commercial fishing vessels. A large size commercial fishing fleet, including vessels from as far north as Canada, concentrates its operations seasonally in the waters of the Atlantic Ocean over the continental shelf between Cape Hatteras and Cape Henry. Currently, shallow depths, unstable channels, and hazardous wave action prohibit all except a relatively small percentage of the seafood taken off the North Carolina Coast above Cape Hatteras from being landed at Wanchese via Oregon Inlet. During inclement weather, the fishing vessels seek a harbor of refuge at Wanchese; but because of the small size of the existing basin, many operators are forced to make long runs either north to Hampton or Norfolk, Virginia, or south around Diamond Shoals at Cape Hatteras to Beaufort, N. C. Petroleum products are currently delivered to Manteo in partially loaded tankers and barges via the existing 6-foot approach channel from Albemarle Sound.

The project would provide for safer navigating conditions through Oregon Inlet and for increased efficiency of Wanchese Harbor as a market for seafood, a port of supply, and a harbor of refuge. Benefits would accrue from reduced vessel-operating costs, reduction in vessel delays and damages, increased catches of seafood, and from utilizing a harbor of refuge relatively close to the ocean fishing grounds.

The project would also permit tankers and barges transporting petroleum products to Manteo to be fully loaded, thereby decreasing the unit cost of the commodity transported and resulting in savings in operating costs. The benefit-to-cost ratio is 1.13 to 1. Average annual benefits are $1,571,000 all for navigation.

MASONBORO INLET JETTIES, N.C.

Senator BIBLE. There is nothing in the budget, and local interests have requested $30,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $30,000 to continue construction by initiating planning for the remaining south jetty.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Masonboro Inlet Jetties, North Carolina

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$5,060,000
Estimated Federal Cost (U. S. Coast Guard		5,000
Estimated non-Federal Cost		18,000
Cash Contribution	$ 0	
Other Costs	18,000	
Total Estimated Project Cost		5,083,000
Allocations to date		1.690.000
Balance to Complete (Corps of Engineers)		3,393,000
Amount that could be used in FY 1974		30,000

Authorization: 1950 River and Harbor Act

Location and Description: Masonboro Inlet is a natural opening through the barrier beach along the Atlantic Coast of North Carolina, in New Hanover County, about 10 miles southeast of Wilmington, N. C. The authorized project provides for: (a) a channel 14 feet deep and 400 feet wide across the ocean bar at Masonboro Inlet, thence 12 feet deep and 90 feet wide to the channel of the Intracoastal Waterway at Wrightsville by way of Banks and Motte Channels; (b) a turning basin, 15 feet deep, having a maximum width of 300 feet and length of 700 feet on the east side of Banks Channel near Masonboro Inlet, with three 15-pile dolphins therein; and (c) a jetty on each side of the inlet, extending to the 14-foot depth in the ocean. Dredging of the channels was completed in June 1959 at a total Federal cost of $487,000; construction of the north jetty and deposition basin was completed 24 June 1966 and 7 July 1966, respectively, at a total cost of $1,203,000. The south jetty and dolphins are yet to be constructed. The jetty on the south side would be about 3,300 feet long.

Proposed Operations: The $30,000 could be used to continue construction. This would permit initiation of planning for the remaining jetty.

Justification: Operation of the Masonboro Inlet project during the period since construction of the north jetty has shown that the jetty is effective in preventing shoaling due to the predominant north-to-south littoral drift. However, Masonboro Inlet is in the area where frequent and extended reversals in the direction of littoral drift occur during which time material is free to move into the inlet from Masonboro Beach. Also, since the north jetty incorporates facilities to bypass material from Wrightsville Beach to Masonboro Beach, under present conditions there is nothing to prevent the return of this material to Masonboro Inlet. Therefore, it is evident that the south jetty should be constructed so as to prevent the littoral drift from Masonboro Beach moving into the inlet and to provide an adequate channel for the users of the project. The benefit-cost ratio is 1.05 to 1. The average annual benefits are $411,000 all for navigation.

Morehead City Harbor, N.C. (1970 Act)

Senator Bible. Budgetary reserve funds in the amount of $27,000 will be available in fiscal year 1974, but there was no budget request. Local interests have requested $30,000. What is your capability on this project?

General Morris. Our capability on this project is $30,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $30,000?

General Morris. The additional amount would be used to complete preconstruction planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Morehead City Harbor, N.C. (1970 Act)

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)	$ 3,960,000
Estimated non-Federal Cost	$ 0
Total Estimated Project Cost	$ 3,960,000
Allocations to date	$ 160,000
Balance to Complete (Corps of Engineers)	$ 3,800,000
Amount that could be used in FY 1974	30,000

Authorization: 1970 River and Harbor Act.

Location and Description: Morehead City, N.C., is located on a peninsula of the mainland about 3 miles northwest of Beaufort Inlet and 80 miles northeast of Wilmington, N.C. The Morehead City Harbor area is at the confluence of Newport River and Bogue Sound adjacent to Beaufort Harbor. The proposed plan of improvement modifies the existing project to provide for an ocean bar channel 42 feet deep and 450 feet wide, to the bend; thence a channel in the bend 40 feet deep and 600 feet wide; thence an inner channel 40 feet deep and 400 feet wide to the turning basin, thence increasing the depth in the east leg of the turning basin to 40 feet, including a 1,200-foot diameter turning area.

Proposed Operations: The 30,000 could be used to complete preconstruction planning.

Justification: Morehead City Harbor, a deep-water port serving Morehead City, N.C., is developing into an important outlet for phosphate ore mined in southeastern North Carolina and also the importation of petroleum products. The benefit that would accrue from the 40-foot depth improvement is the difference in the cost per ton of transporting petroleum products, phosphate rock and sulphur in vessels of 21,000 to 25,000 deadweight tons compared to the cost per ton of transporting those same commodities in vessels of 35,000 to 50,000 deadweight tons. The plan of improvement is considered adequate for existing and prospective commerce. The benefit-cost ratio is 2.5 to 1. Average annual benefits are 2,152,000 all for navigation.

New Hope Lake, N.C.

Senator Bible. The budget request was $7,150,000. The House committee has allowed $4,700,000 and local interests have requested $7,150,000. Can you use the budget amount on this project?

General Morris. No, sir. Due to unavoidable delays, our capability for fiscal year 1974 has been reduced to $4,700,000.

OPPOSITION

Senator Bible. Colonel Irving, we heard testimony from Mr. Brent Blackwelder that the committee direct the Corps not to fill the New Hope Reservoir, but to study the possibility of a dry dam instead. Would you comment?

Colonel Irving. Yes, sir. We have looked into operation of a dry dam. Operation as a dry dam could be for either a short time to allow for some predetermined water quality cleanup to occur or for the full life of the project. In either case, the environmental impact would be the same. To gain some general insight into the effect a dry dam would have on the area, a simulated flood the size of the September 1945 flood was mathematically routed through New Hope Lake project, operated as a dry dam with no sediment or conservation storage. Floodflows entering the reservoir would carry a very heavy sediment load and would be the same for either plan of operation. Depositing of this sediment load would be quite different for the two plans.

For the multipurpose lake, silt-laden water entering the reservoir would have a higher density than the clear water already in storage. Instead of mixing, the incoming water would flow under the lighter water as a density current and occupy the lower portion of the reservoir. The less-turbid water would be forced upward and occupy the upper portion of the reservoir. As the velocity of the inflowing water decreased, the sediment would begin to settle out, being deposited in the sediment pool provided for that purpose. The water flooding over the normally dry land above the conservation pool would be relatively free of sediment and so, there would be very little sediment deposited in this area. For the dry dam, the silt-laden inflow would spread over the entire flooded area, depositing sediment over the normally dry land.

The lush plant growth in the dry dam reservoir would attract a variety of wildlife for nesting, feeding, and resting, only to become a deathtrap in the event of a flood, particularly due to the rapid rate of rise. Especially vulnerable would be the young if the flood comes during the nesting season. Burrowing animals would be vulnerable at all times. Large areas of public-owned land normally are heavily used for recreation even though a lake or reservoir may not be included in the area. Although wildlife would abound in the New Hope dry dam reservoir during extended dry periods, the heavy undergrowth at the lower elevations would make the area virtually inaccessible to the hunter, fisherman, or naturalist. The sediment deposits and mosquito population would make most of the reservoir area undesirable for

recreation. Flat water recreation would also be lost with the dry dam.

Operation as a dry dam would preclude any storage of waters for use as a source for public water supplies or for low-flow augmentation. These benefits would not be realized if the project was operated as a dry dam and the municipalities, whose plans for water supply depend on New Hope, would have to develop new sources.

The alternative of a dry dam is not considered to be more favorable than the proposed plan because of the reduced benefits and adverse environmental effects.

PEMBROKE CREEK, N.C.

Senator BIBLE. There is nothing in the budget, and local interests have requested $35,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $35,000 to initiate and complete construction.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Pembroke Creek, North Carolina

Location and Description: The proposed project is at the mouth of Pembroke Creek, a tributary to Edenton Bay that is an arm of Albemarle Sound, and provides for a channel 8 feet deep, 80 feet wide, and 1,800 feet long. The proposed channel would connect with the existing Federal Edenton Harbor navigation project that is 12 feet deep.

Authorization: 1945 River and Harbor Act

Summarized Financial Data:

Estimated Federal Cost		$ 35,000
Estimated non-Federal Cost		4,500
Cash Contribution	$ 0	
Other Costs	4,500	
Total Estimated Project Cost		39,500
Allocations to Date		0
Balance to Complete (Corps of Engineers)		35,000
Amount that could be utilized in FY 1974		35,000

Proposed Operations: The $35,000 could be used to initiate and complete design and construction.

Justification: In 1971, commercial fishermen at and near Edenton licensed 59 vessels, 19 feet and longer. Commerce at Edenton Harbor during the five-year period (1967-1971) averaged 91,945 tons, consisting of fish, gasoline, pulpwood, timber, posts, piling, and crushed stone. Deepening Pembroke Creek to provide for free, easy, and unobstructed navigation would eliminate the major cause of vessel damages due to groundings and would provide a harbor of refuge for vessels now moored at Edenton Harbor or exposed to strong winds in Albemarle Sound.

Edenton Bay and the waterfront at Edenton are exposed to winds and waves from the southern quadrants. Pembroke Creek forms a natural harbor of refuge off Edenton Bay. However, shallow depths at the mouth of the creek prevent all but the smaller outboard motor boats from using the natural harbor of refuge for a haven during storms. Vessel operators who have used Pembroke Creek have run aground, damaging vessel hulls and running gear.

The Edenton area of Chowan County is designated as Title IV (1) Redevelopment Area under the Public Works and Economic Development Act of 1965 (Public Law 89-136). Local interests believe a deeper channel in Pembroke Creek will stimulate the local economy through increased recreational boating activities. The current benefit-cost ratio is 1.3 to 1. Average annual benefits are $4,100, all for navigation.

Reddies River Lake, N.C.

Senator Bible. The budget request was $130,000, and local interests have requested $386,000. What is your capability on this project?

General Morris. Our capability on this project is $386,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $256,000?

General Morris. The additional amount would be used to complete preconstruction planning.

Caesar Creek Lake, Ohio

opposition

Senator Bible. Mr. Brent Blackwelder, of the Environmental Policy Center, has testified that Caesar Creek Lake would flood out scenic valleys and eliminate fish and wildlife resources. What is the Corps response?

Colonel Eineigl. As we testified last year, portions of valleys will be replaced by a lake that will provide scenic boating and many miles of shoreline. The natural feature known as Caesar Creek Gorge is below the dam and will be enhanced by water releases from the lake during the drier periods. Substantial waterfowl habitat will be provided by the lake, and 4,387 man-days of stream fishery will be replaced by 9,473 and 33,290 man-days of tailwater and lake fishing, respectively. Other wildlife losses will be mitigated by proper land management.

Senator Bible. According to Mr. Blackwelder, the Governor of Ohio has raised serious questions about the desirability of continuing the big dam approach to flood control. What is the Governor's position on Caesar Creek?

Colonel Eineigl. In the past, there has been no indication that the Governor of Ohio is not in accord with the Caesar Creek project. The Governor has withheld support from some projects until local governments enact strong flood plain management practices in downstream areas. Such measures would insure that projects could be operated for the purposes for which they were authorized.

Chillicothe, Ohio

Senator Bible. The budget request was $77,000. The House committee has allowed $150,000, and local interests have requested $150,000. What is your capability on this project?

General Morris. Our capability on this project is $150,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $73,000?

General Morris. The additional amount would be used to complete preconstruction planning.

East Fork Lake, Ohio

opposition

Senator Bible. In testimony before this subcommittee, Mr. Brent Blackwelder, of the Environmental Policy Center, has contended that East Fork Lake would flood out scenic valleys, and eliminate fish and wildlife resources. What will happen when the project, now under construction, is completed?

Colonel Eineigl. Portions of valleys will be replaced by a lake that will provide scenic boating and many miles of shoreline. Substantial waterfowl habitat will be provided in the lake, and 1,300 man-days of stream fishery will be replaced by 7,800 and 21,600 man-days of tailwater and lake fishing, respectively. Other wildlife losses will be mitigated by proper land management.

Senator Bible. Mr. Blackwelder also stated that the Governor of Ohio has raised serious questions about the desirability of continuing the big dam approach to flood control. What is the Governor's position on the East Fork Lake project?

Colonel Eineigl. In the past, there has been no indication that the Governor of Ohio is not in accord with the East Fork Lake project. The Governor has withheld support from some projects until local governments enact strong flood plain management practices in downstream areas. Such measures would insure that the projects could be operated for the purposes for which they were authorized. Here too, the State is reassessing its position. However, as I indicated on the Caesar Creek project, we propose to continue construction as currently scheduled.

Eastlake, Ohio—Chagrin River

Senator Bible. There is nothing in the budget and the House committee has allowed $130,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $130,000 to complete preconstruction planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Eastlake, Ohio - Chagrin River

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$4,320,000
Estimated Federal Cost (U. S. Coast Guard)		10,000
Estimated Non-Federal Cost		1,665,000
Cash Contribution	$1,097,000	
Other	568,000	
Total Estimated Project Cost		$5,995,000
Allocations to Date		275,000
Balance to Complete		5,720,000
Amount that could be utilized in FY 1974		130,000

Authorization: 1965 Flood Control Act

Location and Description: The project is located on Chagrin River, in the city of Eastlake, Lake County, Ohio. Chagrin River flows northerly through the city of Eastlake into Lake Erie about 15 miles east of Cleveland. The plan of flood protection for Eastlake consists of realignment and enlargement of the Chagrin River channel from deep water in Lake Erie through part of the city of Eastlake, construction of arrowhead breakwaters and groins at the mouth of the river, construction of levees, provide a spur channel and an access channel and development of recreational facilities at the river mouth.

Proposed Operations: The $130,000 would be used to complete preconstruction planning.

Justification: Eastlake, Chagrin River is a multi-purpose project for the lower 2-mile reach of Chagrin River. It is primarily designed to provide protection to the city of Eastlake from damages resulting from floods and secondarily to provide a small-boat recreational harbor adequate to meet the needs of existing and the prospective navigation. The maximum discharge of record, which occurred during the March 1948 flood was estimated at 28,000 cubic feet per second, with a recurrence interval of about 60 years. During the January 1959 flood, which was the most damaging of record due to accompanying ice jams, damages in Eastlake are estimated at $206,000 on price levels at time of flood.

Most of the major floods in the basin result from rain on frozen ground. In the lower most reaches of the river, flooding is aggravated by the sand bar in Lake Erie at the mouth of the river. The restrictive sand bar causes ice jams from river ice which when combined with windrowed lake ice results in significantly higher stages and damages than would otherwise occur considering only the discharge. Over 800 recreational craft were based on the lower 1.5 miles of Chagrin River and side channels at Eastlake. Several yacht clubs and marinas have been built along the river bank and in the meandering channels near the mouth. The uncertainty as to entrance conditions is a deterrent to navigation and prevents realization of the full potential of the river mouth as a small boat harbor. The benefit-to-cost ratio is 1.8 to 1. The average annual benefits are broken down as follows:

Navigation	$197,100
Flood Control	189,500
Fish and Wildlife	103,400
Total	$490,000

EMPIRE AND STRATTON, OHIO

Senator BIBLE. There is nothing in the budget, and local interests have requested $35,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $35,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Empire and Stratton, Ohio

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$572,000
Estimated non-Federal Cost		16,000
Cash Contribution	$ 0	
Other Costs	16,000	
Total Estimated Project Cost		588,000
Allocations to date		33,000
Balance to Complete (Corps of Engineers)		539,000
Amount that could be used in FY 1974		35,000

Authorization: 1938 Flood Control Act.

Location and Description: The villages of Empire and Stratton are located in Jefferson County, Ohio, on the right bank of the Ohio River, about 55 miles below the head of the river at Pittsburgh, Pennsylvania. The project would provide a high degree of flood protection to these villages by utilizing Ohio State Routes 7 and 152 in Empire and Ohio Route 7 in Stratton as dikes and providing structures for internal drainage of the area which would be protected by the raised highways.

Proposed Operations: The amount of $35,000 would be utilized to initiate preconstruction planning of the project in FY 1974.

Justification: The villages of Stratton and Empire had a population of 386 and 491, respectively, in the 1970 census. Development in the flood zones is principally residential and commercial with a smaller amount municipal. These developments are accompanied by such accessory improvements as railroads, highways and utilities. The flood areas within the villages of Empire and Stratton are 87 acres and 54 acres, respectively. The December 1942 flood, after complete reduction by the existing reservoir system, was the highest reduced flood of record. The damages to properties at Empire and Stratton, that would result from a recurrence of the highest reduced flood, are estimated at $634,000, August 1965 degree of development adjusted to July 1972 values. The most recent major flood occurred in March 1964 and June 1972. The project would provide protection against all floods as great as the maximum flood of record as modified by the existing reservoir system.

The project would provide flood damage reduction to a total of 141 acres within the villages of Empire and Stratton which are currently not protected along the Ohio River. The benefits would serve to satisfy a part of the projected 1977 basin needs.

The benefit-cost ratio is 1.2 to 1. The total annual benefits for the project are $33,000, all of which are flood control.

Mill Creek, Ohio

Senator Bible. The budget request was $100,000. The House committee has allowed $200,000, and local interests have requested $200,000. What is your capability on this project?

General Morris. Our capability on this project is $200,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $100,000?

General Morris. The additional amount would advance completion of preconstruction planning by 5 months.

Salt Creek Lake, Ohio

Senator Bible. The budget request was $50,000. The House committee did not include any funds, and local interests have requested $50,000. What is your capability on this project?

General Morris. We no longer have a capability on this project Mr. Chairman, since State officials are withholding approval of this project pending completion of an environmental assessment by the State.

OPPOSITION

Senator Bible. In testimony before this subcommittee, Mr. Brent Blackwelder of the Environmental Policy Center stated that the Salt Creek Lake project would flood out the scenic valley and eliminate fish and wildlife resource. Would you please comment?

Colonel Eineigl. The Salt Creek Lake project will not eliminate fish and wildlife resources. The project will be operated for flood control, recreation, and fish and wildlife enhancement. The recreational or seasonal would be about 7.4 miles in length along the existing stream, would have a shoreline about 23 miles long and be about 1,233 surface acres in size. The area to be inundated is approximately 0.3 percent of the total area in the Salt Creek Basin. Present planning contemplates that the lake will be zoned to limit boat speeds and noise in areas to be used for fish and wildlife management purposes. A minimum release rate of 20 cubic feet per second will be observed from April through November to assure maintenance of downstream fishery resources. The anticipated fish and wildlife visitation for the Salt Creek project as it is now planned has been determined by the U.S. Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife. A comparative analysis of the fishing and hunting use was made without the project as compared with the project. It is estimated that the proposed project area receives 5,600 fisherman-days and 1,880 hunter-days use annually without the project.

The total annual man-days use for the combined hunting and fishing activities amounts to 7,480 without the project as compared to 59,130 with the project. In addition to the lands to be acquired for structure sites and operational control under normal real estate policy, it is proposed that 2,250 acres be acquired specifically for recreation. Approximately 85 acres of these additional lands are located downstream of the dam site, to protect and assure public access to the valuable stream fishery immediately below the dam.

UPSTREAM RESIDENTS DISPLACED

Senator BIBLE. Mr. Blackwelder also presented testimony which asserted that the Salt Creek Lake project would displace upstream residents. Would you please comment?

Colonel EINEIGL. A survey in the area of Salt Creek Lake project revealed that approximately 125 residential type dwellings are located in the proposed taking area. Based on statistical data of the U.S. Census Bureau concerning the average family size in this area, it is estimated that about 400 persons will be displaced by the project. The "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970" established fair and equitable treatment of persons displaced as a result of federally assisted programs in order that such persons shall not suffer disproportionate injuries as a result of programs designed for the benefit of the public as a whole. Payment will be made to any displaced person upon proper application and approval for: actual reasonable expenses in moving himself, family, business, farm operation or other personal property; special benefits in connection with relocation from a farm or business; and, in some instances, the difference between the price paid by the Government for the former dwelling and that required to purchase a comparable dwelling which is decent, safe, and sanitary, or if the displaced person is a tenant, the difference in rent between the two places or a down payment on the purchase of a replacement property.

Senator BIBLE. Would you comment on the opposition of the Salt Creek Lake project by the State of Ohio?

Colonel EINEIGL. Recent correspondence from Governor John J. Gilligan indicates that he cannot establish an official position concerning the Salt Creek Lake until a revised environmental impact statement is received and approved by the appropriate State agencies in Ohio. The State's policy concerning flood plain regulation in conjunction with flood control structures, according to the Governor's letter, does not apply to the Salt Creek Lake project. The scenic Salt Creek Valley Association and the commissioners of Ross and Vinton Counties have expressed opposition to the project. However, recent correspondence indicates full support of the project by the commissioners of Pike County and the South Central Ohio Preservation Society, Inc.

UTICA LAKE, OHIO

Senator BIBLE. The budget request was $40,000. The House committee did not include any funds, and local interests have requested $40,000. What is your capability on this project?

General MORRIS. We no longer have a capability on this project Mr. Chairman, since State officials are withholding approval pending reformulation of the project.

ARKANSAS-RED BASINS CHLORIDE CONTROL, OKLA., TEX., AND KANS.

Senator BIBLE. The budget request was $300,000. The House committee has allowed $800.000 and local interests have requested $800,000. What is your capability on this project?

General MORRIS. Our capability on this project is $800,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $500,000?

General MORRIS. The additional amount would be used to advance completion of preconstruction planning 9 months.

CLAYTON LAKE, OKLA.

Senator BIBLE. The budget request was $600,000. The House committee has allowed $1 million and local interests have requested $1 million. What is your capability on this project?

General MORRIS. Our capability on this project is $1 million, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $400,000?

General MORRIS. The additional amount would be used to advance acquisition of real estate.

COPAN LAKE, OKLA.

Senator BIBLE. The budget request was $1,560,000. The House has included $1,560,000 and local interests have requested $10,300,000. What is your capability on this project?

General MORRIS. Our capability on this project is $10,300,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $8,740,000?

General MORRIS. The additional amount would be used to continue construction and would provide for initiation of additional relocations and the main dam contract.

HUGO LAKE, OKLA.

Senator BIBLE. The budget request was $2,800,000. The House committee has allowed $4 million and local interests have requested $4 million. What is your capability on this project?

General MORRIS. Our capability on this project is $4 million, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $1,200,000?

General MORRIS. The additional amount would be used to advance completion of the project 6 months.

LUKFATA LAKE, OKLA.

Senator BIBLE. There is nothing in the budget. Local interests have requested $200,000. What is your capability on this project?

General MORRIS. Mr. Chairman, we do not have now a construction capability due to the need to resolve environmental issues. Funds held in budgetary reserve are sufficient for that planning effort.

SKIATOOK LAKE, OKLA.

Senator BIBLE. The budget request was $1 million. The House committee has allowed $1,500,000. What is your capability on this project?

General MORRIS. Our capability on this project is $2,500,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the $500,000 added by the House committee?

General MORRIS. The additional amount would be used to continue construction on the initial contracts.

APPLEGATE LAKE, OREG.

Senator BIBLE. There is nothing in the budget, but there is $100,000 in budgetary reserve for release in fiscal year 1974. The House committee has included nothing for fiscal year 1974 and has deleted the funds in reserve. Local interests have requested $750,000 in addition to the funds in reserve. What is your capability on this project?

General MORRIS. Our capability on this project is $750,000 in addition to the funds in reserve, subject to modification of the authorizing legislation, as explained in our budget justification sheets, sir.

Senator BIBLE. What would be accomplished with the additional $750,000?

General MORRIS. The additional amount would be used to initiate construction and continue land acquisition and design, sir.

ROGUE RIVER PROJECTS (APPLEGATE, LOST CREEK, ELK CREEK), OREG.

OPPOSITION

Senator BIBLE. Mr. Brent Blackwelder, representing the Environmental Policy Center and the Sierra Club, appeared before this committee in opposition to the three Rogue River dams. Last year I recall we had similar objections to the funding of the Lost Creek project because of the turbidity problem. Would you review for the committee the nature of the problem and what progress you have made to overcome it?

Colonel DRISCOLL. Last year the committee was informed that preliminary studies in early 1972 showed that there would be no long term turbidity problem at Lost Creek and that any turbidity that might develop could be managed in such a manner that the total water quality in the reservoir and downstream would be improved when compared to that which exists in the system as a whole. The final reports on these studies which are nearing completion, are expected to confirm last year's findings. I might add, sir, that eminent geologists from Oregon State University and Southern Oregon College in Ashland have concurred in our preliminary findings.

Senator BIBLE. Objections to the funding of Elk Creek and Applegate appear to be primarily based on a severe turbidity problem at nearby Emigrant Reservoir which has caused damage to the Rogue River. Do you anticipate similar turbidity problems from the operation of the Elk Creek and Applegate projects?

Colonel DRISCOLL. Because of our concern about water quality in the Rogue we have also initiated water quality studies on Elk Creek. Geo-

logic investigations, soil mapping, and soil testing have been carried out and data collected for use in a mathematical model. This model developed by our Waterways Experiment Station in Vicksburg will be used to predict turbidity and evaluate alternate operating procedures including selective withdrawal from varying reservoir levels for turbidity control. We are confident that the model will indicate that turbidity will not be a problem in the reservoir or in the river downstream during floods. Settlement of silts in the reservoirs will appreciably reduce the turbidity downstream by trapping the larger portion of sediments produced by silts in the watershed area. Except for continued monitoring to obtain data for the model study which will determine the optimum operation for turbidity control our basic turbidity studies are complete. We are confident that the model will indicate that the downstream releases can be controlled to the quality required in the Rogue River.

Turbidity studies have recently been initiated on the Applegate River. We expect no long-term turbidity problem at this project.

Rarity of Siskiyou Mountain Salamander

Senator Bible. Mr. Blackwelder also stated that the Applegate project could eliminate the Siskiyou Mountain Salamander, a rare and endangered species. Please comment on the salamander and the project's impact on this species.

Colonel Driscoll. The Siskiyou Moutain Salamander habitats an area at, and in the vicinity of, the project. This animal was first identified in 1965 and its present rarity may simply be due to lack of knowledge of the species. Very little is known of this salamander's habits, but they have been found on mossy rocks and wet places near running water. The species has no known economic value but its elimination would remove any future possibility to study any aspect of the biology or evaluation of the species or its population. An investigation will be initiated in fiscal year 1973 to learn more about this salamander and to see if it is truly endangered. We will study its distribution and life history and evaluate the potential impacts of the proposed Applegate dam on its life patterns. Also to be studied are the possibilities of relocating the species and maintaining its population in a new locality.

Senator Bible. Colonel, I know that the Corps is well aware of the great fish and wildlife resources of the Pacific Northwest and has taken special measures to improve fish migrations past those great projects out there. Will you take appropriate measures to assure the continuation of the Siskiyou Salamander?

Colonel Driscoll. Yes, sir, we will.

Bonneville Lock and Dam, Oreg. and Wash. (Second Powerhouse)

Senator Bible. There is nothing in the budget, and local interests have requested $3 million. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $3 million to initiate construction.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Bonneville Lock and Dam, Oregon and Washington (Second Powerhouse)

Summarized Financial Data:

Estimated Total Appropriation Requirement		$267,000,000
Future non-Federal Reimbursement		-262,533,000
Estimated Federal Cost (Ultimate)		4,467,000
Estimated non-Federal Cost:		$262,533,000
Reimbursement: Power	$259,676,000	
Recreation	2,857,000	
Total Estimated Project Cost		$267,000,000
Allocations to Date		2,886,000
Balance to Complete		264,114,000
Amount that could be utilized in Fiscal Year 1974		3,000,000

Authorization: 1933 Federal Emergency Administration of Public Works
1935 River and Harbor Act
1937 Bonneville Project Act

Location and Description: The existing Bonneville Lock and Dam is located on the Columbia River, at river mile 146, about 42 miles east of Portland, Oregon. The proposed plan of improvement provides for construction of a second powerhouse and installation of eight additional generating units with a total capacity of 540,800 kilowatts.

Proposed Operations: The amount of $3,000,000 could be used to initiate construction.

Justification: The installation of additional generating capacity at Bonneville is required to meet continually growing area power needs. Load resource studies prepared by the Bonneville Power Administration demonstrate development of a precarious power shortage in the Columbia-North Pacific Region. Maximum power benefits will result from provision of sufficient generating capacity at all Columbia River projects to fully utilize the increases in average flow resulting from upstream storage provided by Canadian Treaty projects and new storage projects in the United States. Installation of additional hydroelectric capacity at Bonneville will also reduce excessive spill at that project and, consequently, reduce nitrogen supersaturation conditions in the river below Bonneville, with a corresponding improvement in conditions affecting the vitally important anadromous fishery in the Columbia North Pacific area. The benefit-to-cost ratio is 2.3 to 1. Average annual benefits are listed below:

Annual Benefits	Amount
Power	$24,128,000
Recreation	3,791,000
TOTAL	$27,919,000

Coos Bay, Oreg.

Senator Bible. Budgetary reserve of $50,000 will be available in fiscal year 1974, but there was no budget request.

Local interests have requested $150,000. What is your capability on this project?

General Morris. Our capability on this project is $150,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $150,000?

General Morris. The additional amount would be used to continue preconstruction planning.

Grande Ronde Lake, Oreg.

Senator Bible. There is nothing in the budget, the House committee has allowed zero, and local interests have requested $80,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $80,000 to initiate planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Grande Ronde Lake, Oregon

Summarized Financial Data:

Estimated Total Appropriation Requirement		$21,800,000	
Future non-Federal Reimbursement		11,132,000	
Estimated Federal Cost (Corps of Engineers)			$10,668,000
Estimated Federal Cost (U.S. Forest Service)			713,000
Estimated non-Federal Cost			11,132,000
Reimbursement:	Irrigation	$10,393,000	
	Water Supply	739,000	
Other Costs:	None		
Total Estimated Project Cost			$22,513,000
Allocations to Date			0
Balance to Complete			$21,800,000
Amount that could be utilized in Fiscal Year 1974			$ 80,000

Authorization: Flood Control Act of 1965.

Location and Description: The project will be located on the Grande Ronde River approximately 11.0 miles upstream from the city of LaGrande, Union County, Oregon. The plan of improvement provides for construction of a dam about 193 feet high to create a lake with a storage capacity of about 160,000 acre-feet for flood control, irrigation, recreation, water supply, and fish and wildlife purposes. Provision will also be made for the inclusion of additional fish facilities and recreation facilities at a future date.

Proposed Operations: The amount of $80,000 could be used to initiate preconstruction planning.

Justification: The Grande Ronde Lake project would provide protection against rainfall and snowmelt type floods in the Grande Ronde River Basin, particularly at the city of LaGrande and in the Grande Ronde Valley between LaGrande and Elgin, Oregon. In addition to providing flood control, the reservoir storage will provide water for irrigation, municipal and industrial water supply, recreation, and maintenance of resident and anadromous fisheries. The benefit to cost ratio is 1.01 to 1. Average annual benefits are listed below:

Annual Benefits	Amount
Flood Control	299,000
Irrigation	218,000
Downstream power	13,000
Fish and Wildlife	93,000
Recreation	250,000
Water Supply	45,900
Total	918,900

WILLAMETTE RIVER BASIN, OREG.—BANK PROTECTION

Senator BIBLE. The budget request was $450,000. The House committee has included $700,000 and local interests have requested $700,000. What is your capability on this project?

General MORRIS. Our capability on this project is $700,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $250,000?

General MORRIS. The additional amount would be used to provide protection to two critical erosion areas 1 year earlier than now scheduled, sir. However, completion of the overall project would not be advanced.

WILLOW CREEK LAKE, OREG.

Senator BIBLE. There is nothing in the budget. Local interests have requested $640,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $640,000 to initiate construction. I would like to inform you at this point that it now appears probable that we will make major design changes in the authorized plan. These changes may well include deletions of some project purposes. Unfortunately, we have not yet progressed to the point where the magnitude, scope, or even the certainty of these changes are known.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir; however, the data submitted will, of course, only be applicable to the currently contemplated plan.

[The statement follows:]

Project: Willow Creek Lake, Oregon

Summarized Financial Data:

Estimated Total Appropriation Requirement		$ 12,900,000	
Future non-Federal Reimbursement		4,510,000	
Estimated Federal Cost (Ultimate)			8,390,000
Estimated non-Federal Cost:			4,529,000
Reimbursement:	Irrigation	4,260,000	
	Water Supply	139,000	
	Recreation	111,000	
Other Costs:	ROW and Relocations	19,000	
Total Estimated Project Cost			$12,919,000
Allocations to Date			632,000
Balance to Complete			12,268,000
Amount that could be utilized in Fiscal Year 1974			640,000

Authorization: Flood Control Act of 1965.

Location and Description: The project will be located on Willow Creek just below the confluence of Balm Fork, immediately upstream from the city of Heppner, in Morrow County, Oregon. The plan of improvement provides for construction of a rock and earthfill dam, 155 feet high on Willow Creek, together with an improved channel through the city of Heppner. The lake would have a total capacity of 11,500 acre-feet.

Proposed Operations: The amount of $640,000 could be used to initiate construction.

Justification: The proposed plan of improvement would provide protection against heavy rainfall, snowmelt, and cloudburst-type floods in the Willow Creek Basin, particularly at the city of Heppner, Oregon, where serious loss of life is a potential. In 1903 a cloudburst, centering on the watershed above the proposed dam, produced a flood without warning, resulting in the loss of 247 lives, one of the worst natural disasters of its kind in the history of the Nation. The project would have fully controlled that flood. Willow Creek Lake, while it will be operated primarily for flood control, will store water that will be used for other purposes, including irrigation, fish and wildlife, recreation, municipal and industrial water supply and water quality control. The benefit-cost ratio is 1.18 to 1. Average annual benefits are listed below:

Annual Benefits	Amount
Flood Control	$ 361,000
M&I Water Supply	4,600
Irrigation	107,400
Water Quality Control	12,200
Recreation	34,000
Fish and Wildlife	42,000
Total	$ 561,200

Acid Mine Drainage, Clarion River, Pa.

Senator Bible. There is nothing in the budget, and local interests have requested $175,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $175,000 subject to authorization to initiate preconstruction planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Acid Mine Drainage, Clarion River, Pennsylvania

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)	$27,200,000
Estimated non-Federal Cost	0
Total Estimated Project Cost	27,200,000
Allocations to date	0
Balance to Complete (Corps of Engineers)	27,200,000
Amount that could be used in FY 1974	175,000

Authorization: Not authorized.

Location and Description: The proposed project is located in the Clarion River Basin, northwestern Pennsylvania, in Clarion, Forest, Elk and Jefferson Counties. The project is directed towards the control of acid drainage from inactive and abandoned mines and oil and gas fields in the six major polluting watersheds of the Clarion River Basin. About 45 principal contributing acid sources in these watersheds will be abated with lands reclaimed by various measures including deep mine seals, grout curtains, diversion ditches for surface water, strip mine backfilling, lime injection, removal or neutralization and demineralization of the mine drainage. The objective of the program is to provide at least 75 percent reduction of the net acid load in the lower Clarion River.

Proposed Operations: Subject to authorization, the amount of $175,000 would be used to initiate preconstruction planning. Aerial photography and mapping of the watersheds would be accomplished. The location of all water discharges would be initiated and measuring devices set up for the collection of hydrologic data.

Justification: Water pollution and land restoration problems have plagued the Clarion River Valley and hindered its economic and recreation development for many years. The pollution is caused primarily by sulphuric acid from abandoned and active mines and chemically related mineral salts and sediment formation and deposition. The acid mine drainage and land reclamation proposed for implementation in conjunction with the future construction of the St. Petersburg Lake will largely correct the wrongs of water pollution and land degradation, and inattention to the downgraded environment throughout the valley. These measures will create an environment which will support diversity and permit individual choice of needs satisfaction, and will obtain optimal recycling of usable water and minerally depleted land resources. The proposed St. Petersburg Lake project would utilize the reclaimed strip-mined lands and convert these to better use for human ecology, as a major environmental impact. Pollution improvement by selective abatement together with construction of St. Petersburg Lake will provide water of a quality usable for recreational purposes, water supply and for low-flow augmentation in the Allegheny and Ohio Rivers. No benefit-cost ratio has been developed specifically for the acid mine drainage pollution abatement. Benefits derived from pollution abatement are included in economics of the proposed St. Petersburg Lake project.

Raystown Lake, Pa.

OPPOSITION

Senator Bible. Colonel Irving, we have received testimony from several landowners regarding the acquisition of land necessary for the Raystown project in Pennsylvania. Could you generally describe how appraisals are obtained at that project?

Colonel Irving. Every tract of land required for the project is appraised by professional qualified appraisers who are specifically instructed to develop the current fair market value of the real estate involved. The fair market value is predicated upon what similar and comparable properties are selling for in the immediate area. The district engineer has utilized the services of both staff appraisers and contract appraisers. These men are qualified and experienced in appraising the types of real estate found in the Raystown Lake project. Every appraisal report is reviewed by staff reviewing appraisers for acceptance and compliance with professional appraisal standards. Each contract appraiser was approved by the appraisal division of the Office of the Chief of Engineers as to their experience and qualifications in the field of real estate appraising.

Senator Bible. Are appraisals based on current market value?

Colonel Irving. Yes, sir. Appraisals of farms and homesites are based on recent sales of property in the same area which are similar to the property being acquired. In the case of the Garner property, for example, the appraisal was made in 1971. Comparable sales on which it was based occurred during the 1968–70 period. That property was used for three different purposes: rural homesite, timber production, and livestock production. One of the judgment factors entering into the appraisal process is the correlation of sales representative of the different uses. A separate timber cruise was made on the Garner property and the results thereof were taken into account in arriving at a total estimate of fair market value.

FAIRNESS OF ESTIMATING PROPERTY VALUES

Senator Bible. Do you consider this to be a fair method of estimating the value of property you acquire?

Colonel Irving. Sir, we consider our method of arriving at estimated fair market value by comparison of transactions in the marketplace as representing a true method of determining value. Furthermore, the courts have accepted this as being the best indicia of market value. By employing this method, the Corps has been able to acquire approximately 85 percent of required land by negotiations. In addition, agreement as to price has been reached on some of the land in condemnation but title defects prevent closing the transaction by purchase.

Senator Bible. It has been alleged that your negotiators make untruthful statements and are arrogant.

Colonel Irving. Sir, it is not the policy of the Corps or its negotiators to be untruthful or arrogant. Our negotiators are instructed in the law and in our policy. They are told that landowners are to be treated with courtesy and respect. In accordance with Public Law

91–646, each landowner is furnished the Government's estimate of just compensation and a written statement of, and summary of the basis for, the amount estimated as just compensation. The negotiators for the Corps pursue realistic negotiations with the owners under Public Law 91–646 in an attempt to reach agreement with the landowner at a price which is fair to the landowner and to the Government. In every instance the first offer to the owner is not less than the amount of the Government appraisal. If the owner is unwilling to settle for this amount, he is encouraged to state his opinion of value and to make a counter offer. Negotiations with all owners are continued until agreement is reached within a reasonable range of the Government appraisal or it becomes apparent that no such agreement can be reached. In the latter event, the owner is informed that the amount to be paid for the property will have to be determined by the U.S. district court, where the owner will be able to offer evidence as to the value of his property. If condemnation is necessary, a proceeding is filed in the appropriate Federal court and the Government's estimate of just compensation, again not less than the approved appraisal, is deposited into the registry of the court. Upon proof of ownership and approval of the court, the owner may withdraw up to 100 percent of the amount deposited without prejudice to his right to contest the Government's estimate at a trial on the issue of just compensation.

Senator BIBLE. Do you negotiate on a "take it or leave it" basis?

Colonel IRVING. No, sir. For example, our records indicate that in attempting to purchase property owned by Mr. and Mrs. Clair Grove, four contacts for negotiations were made with the Groves and four with their attorney, Mr. Heffner. Five separate amounts were proposed, ranging from $54,000 to $67,375, or an increase of over $13,000. During the same period, the Groves reduced their demand from $82,800 to $80,000. Honest attempts were made to reconcile the difference as to the price to be paid for the land.

REPLACEMENT OF HOMES, FARMS, AND BUSINESSES

Senator BIBLE. Does the Corps provide replacement of homes, farms and businesses?

Colonel IRVING. No, sir, we do not. However, we do pay just compensation for properties we acquire. In addition, title II of Public Law 91–646 provides for payments to eligible landowners and their tenants which are over and above the traditional concept of fair market value, including reimbursement for actual moving expenses and losses resulting from moving, or an alternative payment in lieu of actual expenses which amounts to approximately $500 for a home and from $2,500 to $10,000 for a business or farm operation, depending upon average business or farm income. The law also provides for a replacement housing payment of up to $4,000 for tenants and up to $15,000 for owners to enable a displaced person to rent or purchase a decent, safe and sanitary home at least comparable to his former home. Furthermore, relocation advisory assistance services are provided to aid property owners in finding suitable replacement property. For example, Mr. and Mrs. Ralph A. Garner have been shown available comparable housing located in Penn Township which we consider

decent, safe, and sanitary. The Garners' owned approximately 26 acres and the comparable property was located on a 1-acre lot. We do not believe the law provides for replacement of the actual acreage, but rather comparable housing located on a reasonable sized lot in relation to the area used for the homesite.

Senator BIBLE. Did you allow a pipeline company to come on the Garner land to do some construction without authority?

Colonel IRVING. No, sir, we did not. We secured a right-of-entry from the party in possession, in this case, from Mr. Garner. Since a right-of-entry is of a temporary nature for a specific purpose, it was not considered necessary to obtain permission from each owner, especially in view of the fact that this property was owned by Mr. and Mrs. Garner, both of whom were aware that a right-of-entry had been executed.

RIGHT TO SALVAGE IMPROVEMENTS

Senator BIBLE. It has been alleged that you deal unfairly with property owners as to their right to salvage the improvements on their property.

Colonel IRVING. Senator, in each and every instance unless otherwise needed for project purposes, and this is rare, every property owner is given the opportunity to salvage the improvements located on his property. This, of course, reduces the amount offered by the value of the salvaged property. I believe Mr. and Mrs. Grove have raised a question about their salvage rights. Mr. Grove was informed that he had the right to salvage the improvements prior to the condemnation of his property in early 1972. Mr. Grove did not express a desire to retain his salvage until January 29, 1973; however, on December 20, 1972, a clearing contract was let which granted salvage rights to the contractor. The district engineer in Baltimore discussed this matter with the contractor and the contractor agreed to forego salvage of the Grove improvements. I have been informed that the Groves have completed the salvage of the improvements. Since we did not acquire any personal property from Mr. and Mrs. Groves, they were free to take it with them or abandon it as they desired.

Senator BIBLE. Mr. and Mrs. Charles Hess of Aitch, Pa., claim you will not pay them for moving their $5,000 merchandise inventory.

Colonel IRVING. Under section 202 of Public Law 91–646, a person owning a business may be compensated either for actual, reasonable moving expenses of personal property used in connection with the business or an amount equal to one-half of any net earnings of the business or farm operation during the 2 taxable years immediately preceding the taxable year in which the business moves from the property acquired for the project. Mr. and Mrs. Hess operate a general merchandise store from their home. They have been offered $30,500 for the dwelling and $7,000 under section 202 of Public Law 91–646. We have ascertained that it would be to their benefit to take the $7,000 based on the loss of business rather than being paid for the expense of moving the merchandise.

NO PROJECT BOUNDARY CHANGE

Senator BIBLE. About a year ago, we had some testimony from Mr. Daniel C. Morningstar of Silver Spring, Md., questioning the necessity of acquiring his land in the Allegrippis Ridge area. He has furnished further testimony and letter requesting withholding of fiscal year 1974 appropriations pending further investigation. At that time you indicated no change in the project boundary to delete the Morningstar property. Are you still of that view?

Colonel IRVING. Yes, sir, there have been no changes in plans. To implement the recreation requirement, the immediate area of the Morningstar property has been earmarked as the "Seven Points" recreational area. Just to the west of his property a large area is to be acquired for wildlife mitigation to replace present areas flooded by the project. To the northwest of the property is an area to be acquired for construction of the Hesston dike, on the headwaters of the James Creek. Acquisition of this property was included in the original project plan and is necessary to achieve an integrated, systematic pattern in that area.

Senator BIBLE. Is it true that you have approved changing the acquisition line on an ownership near that of Mr. Morningstar to delete 46 acres from the proposed acquisition but refuse to make a similar change for Mr. Morningstar?

Colonel IRVING. I believe Mr. Morningstar is referring to tract 2526 owned by Mabel Morningstar. Our original plans call for the acquisition of this entire tract since our maps indicate that 46 acres would be left without access. Our first investigation revealed that a public road in this area will provide access to this 46 acres; therefore, we have changed our acquisition boundary line to delete this remainder.

Senator BIBLE. Have you renewed your plans to establish a golf course on the Morningstar property?

Colonel IRVING. No sir, we have not. If I may, sir, I would like to state that justification for the original acquisition of this tract included acquisition to the ridge for scenic and resource protection. These factors do not appear to have been included in previous matter presented.

Senator BIBLE. Is there anything else?

Colonel IRVING. Yes, sir, if I may update certain information presented a year ago. At that time, I stated that 1,284 tracts had been acquired with 1,126 having been acquired by direct purchase and 158 or 12.3 percent have been acquired by condemnation proceedings. As of March 31 of this year, 1,458 tracts have been acquired of which 1,282 have been acquired by negotiations and 176 have been condemned. This still leaves the number of tracts in condemnation well below the national average at 13.7 percent of project total. Land acquisition at this project is now approximately 80 percent complete.

TOCKS ISLAND LAKE, PA., N.J., AND N.Y.

BUDGET REQUEST AND CAPABILITY

Senator BIBLE. The budget request was $5,100,000. The House committee has allowed $5,100,000, and local interests have requested $8,100,000. What is your capability on this project?

General MORRIS. Our capability on this project is $10 million, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $4,900,000?

General MORRIS. The additional amount would be used to advance land acquisition.

OPPOSITION

Senator BIBLE. Colonel Irving, in testimony before this committee there were made certain comments in opposition to the Tocks Island Lake project. Among these was the statement by Mr. Christopher Colt on behalf of Trout Unlimited that the Tocks Island Lake project should not move ahead until the Corps of Engineers has satisfactorily resolve some serious environmental questions with respect to probable eutrophication of the lake, reservoir drawdown and chemical and waste runoff upstream from the proposed project. Would you comment?

Colonel IRVING. Yes, sir. Steps are either completed, underway or planned to avoid conditions which could lead to an advanced state of eutrophication. The design of the dam outlet works, operating program and management approaches already existing will be adequate to avoid the problems of accelerated cultural eutrophication when taking into account existing stream quality laws.

With regard to drawdown, an extreme condition and one that could statistically occur 1 percent of the time would result in a daily drawdown averaging from 3 to 4 inches over a 90-day period. Similar drawdown has not proven harmful to fishery resources in existing impoundments with even greater drawdown. A study titled "Indices to Lake Production and Their Disturbed Water Levels" was presented at a 1957 symposium on "Investigation of Fish—Power Problems." The report was prepared by E. W. Rawson. Examples in that report are Lake Minnewanka with an annual drawdown of 35 feet without any detectable adverse effect on fish population or quality. Sports on TVA reservoirs such as Wantago with a 100-foot annual drawdown, South Holston with an 80-foot annual drawdown and Cherokee with a 60-foot annual drawdown show no detrimental effects on fish population, production, or health.

On waste runoff, upstream pollutant sources must be controlled in order to meet the current Federal water quality standards. Enforcement of water quality regulations in upstream areas will ameliorate the potential for excessive eutrophication of project waters. Special attention by both the Delaware River Basin Commission and the Corps of Engineers is being given to upper basin effects on water quality. A recent model study confirmed that the proper strategy is to address known point sources impacting the project area initially and then, in concert with EPA, participate in a national program which addresses the nonpoint source problem.

FLOODWATER STORAGE

Senator BIBLE. The rainfall from storm "Agnes" did not occur in the area of the big dams on the Susquehanna, General Jadwin on Dyberry Creek and Prompton Reservoir on the Lackawanna River. In order to contain the downpour of the magnitude of "Agnes", Mr. G. E.

Schindler, Jr., representing the League for Conservation Legislation, stated that there would have to be 522 new dams on the Susquehanna similar to the 23 already there, according to some testimony we have had.

Colonel IRVING. Since we have no control over the location of the rainfall, it sometimes will occur that intensive rainfalls in areas not draining into reservoirs designed for flood control. However, the percentage of area above critical damage reaches controlled by dams is a measure of their probable future effectiveness. Jadwin and Prompton Reservoirs are designed primarily to protect Honesdale, Pa., and other areas along the Lackawaxen River, and it is true that during the "Agnes" storm appreciable storage of floodwaters did not take place in these projects.

An article in the Philadelphia Inquirer, on April 29 quoted additional information, from a report by Professor Adams. It appears that his analysis was not based on an engineering approach. The article in the Inquirer states that the Susquehanna River received 3,400 billion gallons of water during the "Agnes" storm, of which only 147 billion could be held in the 23 existing reservoirs. Data published by the Corps Hydrologic Engineering Center indicates 9 inches of rainfall for the basin above Harrisburg. This is equivalent to 3,700 billion gallons or essentially the same as used by Professor Adams. It appears that Professor Adams then assumed that the difference, about 3,300 billion would need 522 more reservoirs to contain it.

Such an approach unrealistically assumes that all the rain that fell must be stored, without any reduction due to infiltration or runoff in streams that could occur without causing damage. Actually most streams and rivers can safely pass considerably greater than normal or average flows before overbank flow and damage occurs.

DELAWARE BASIN FLOOD CONTROL DAMS

Senator BIBLE. Mr. Schindler further stated that theDelaware basin already has 31 flood control dams, some of them very large. In order to contain the waters of storm "Agnes", the Delaware basin would have to have 202 more dams of the sort it already has.

Colonel IRVING. The source of 31 flood control dams in the Delaware basin is not known. The Corps of Engineers has constructed four and there are others that have some flood control capability that were constructed by other Federal and State agencies. However, the three large dams mentioned in the testimony are the New York City Water Supply Dams and cannot be counted on for large flood storage.

Senator BIBLE. Mr. Schindler also cited the following examples of new currents of thought about water resources planning that should be adopted:

The use of balanced mix of removal of structures from flood plains, moderate diking and floodwall construction, floodproof and flood-resistant construction, as an ecologically sound alternative to big dams.

The use of high-flow skimming, and of high-flow skimming combined with small impoundments, to provide needed water supplies.

The fitting of recreational facilities to the natural characteristics of river basins, not to the gross distortions of natural rivers resulting from large dams and artificial reservoirs. What comments do you have to offer?

Colonel IRVING. Sir, the Corps of Engineers does not neglect nonstructural alternatives to flood control. The Corps is deeply involved in both flood plain information studies and flood insurance studies. In areas where industrial and commercial use of flood plains is an economic necessity, flood control and flood plain management are necessary partners. This is what the Corps of Engineers is advocating for the Delaware River Basin. Information on the proposal to supply northern New Jersey from the Delaware by high-flow skimming is contained in a report by the U.S. Department of the Interior dated March 1973. The report states that "The high flow skimming proposal calls for up to 600 mgd (928 cfs) diversion from the Delaware during the 9 or more months of high flows in a typical year." The U.S. Bureau of Sports Fisheries and Wildlife recommendation to the Corps of Engineers stipulates no diversion be made during April, May, and June to safeguard the oyster beds in Delaware Bay. With low flows occurring during the July-to-September period, flows for 9 months are not available for diversion to off-stream reservoirs. A discharge of 3,000 cfs in the Delaware River at Trenton is needed to keep the 250 mg/l. isochlor sometimes called the salt front at or below the mouth of the Schuylkill River. One purpose for keeping the 250 mg/l. isochlor at or below the mouth of the Schuylkill is to protect Philadelphia's water supply at Torresdale.

PUMPING OF GROUNDWATER

Of greater concern to New Jersey officials is protection of groundwater for public supply in places such as Camden, Westville, National Park, Paulsboro, and Gibbstown, and for industrial supply at many locations. Pumpage of ground water probably induces recharge from the Delaware into adjacent aquifers at many of these locations. Flood skimming for water supply was previously studied by both the DRBC staff and the New Jersey Bureau of Water Resources Planning and Management, and rejected by both as insufficient to meet the needs.

In addition to the findings of that report, such a scheme is also unfavorable from an economic point of view.

All reasonable water supply alternatives have been investigated and no alternative has been identified that compares favorably to the water supply capability and costs of the Tocks Island project.

Subsequent to authorization of the Tocks Island Lake project the recreational potential of the project area was recognized. In 1965, the Delaware Water Gap National Recreation Area was authorized by Public Law 89–158 as part of the Tocks Island project. With regard to separating the National Recreation Area from the Tocks Island project, it is the opinion of the Corps of Engineers that Public Law 89–158 makes existence of the National Recreation Area contingent upon existence of the Tocks Island project and that no authority exists for completion of the National Recreation Area if the Tocks Island project is not built.

PROJECT JUSTIFICATION, BENEFITS, AND OPERATION

Senator BIBLE. There have been other adverse comments about the project justification, its benefits, and its operation by representatives of the New Jersey Chapter of the Sierra Club; Save the Delaware

Coalition; Tri-County Conservancy; and lower Bucks County Municipalities and authorities. Would you comment?

Colonel IRVING. Yes, sir. First, regarding economic justification the benefits and costs for the Tocks Island Lake project have been evaluated in accordance with the policies, standards and procedures for the formulation and evaluation of water resource projects as set forth in Senate Document No. 97, 87th Congress, 2d Session.

Second, regarding the benefits, let me offer a few explanations. With regard to electric power, economic justification of Tocks Island Lake includes benefits from conventional power development and does not incorporate potential benefits from the pumped storage hydropower scheme proposed by private interests. Phase I of the Yards Creek pumped storage hydropower project (300,000 kw) has been in operation since 1965 and has been providing net benefits to the New Jersey Electric Utilities.

A rough estimate is the trading of 3 watts of base power for 2 watts of peak power. Cost comparisons favor pumped-storage over other methods of power generation for peak power. The pumped-storage is proposed not by the Federal Government but by utility companies, who are quite cost conscious and knowledgeable. Public Law 91–282 only authorized the New Jersey Electric Utilities to use the head and waters of Tocks Island Lake for their pumped-storage proposal. It did not authorize construction of such facilities. Consequently, until this proposal is licensed by the proper regulatory authorities, there is no reason for the Corps of Engineers to reevaluate economic justification for Tocks Island Lake. Current economic justification for the project relates to authorized Federal development only.

FLOOD CONTROL

With regard to flood control, the need for the flood control that would be provided by the Tocks Island project is most strikingly demonstrated by transposing the recent storm "Agnes" over the Delaware River Basin. Preliminary analysis indicates that the rainfall from storm "Agnes" would have raised the water levels in the Delaware River from 3 to 5 feet above that which was experienced in the 1955 flood and would have caused approximately $190 million in damage along the main stem alone. However, more than $160 million (80 percent) of these damages would have been prevented by the Tocks Island project.

With regard to water supply, the 1970 population of the combined Delaware River Basin and service area, totaling 25 million persons, is forecast to grow to some 40 million by the year 2020. Meanwhile, water use will double. Development of the water resources to sustain and nourish this anticipated growth is basic to the economy and well being of the region.

To accommodate the growth, a network of water supply facilities has been projected and included in the Delaware River Basin Commission's comprehensive plan. Comparison of available water resources with projected future demands demonstrates the immediate need for substantial additional storage capacity in the basin. While there are several Delaware Basin reservoirs, only three, part of the New York City system, are capable of storing water for release dur-

ing dry periods. Their primary function, moreover, is as water suppliers for New York, and downstream releases are not nearly adequate to meet future supply demands in the basin. They offer, at best, a partial solution to the perennial Delaware water supply dilemma of too much water or too little, but rarely just enough.

FUTURE GROWTH

Future growth in the Delaware Basin, coupled with projected water demands, dictates a flow and storage capacity vastly in excess of that now available. The Tocks Island Reservoir would be the keystone of the water supply management program in the Delaware Valley.

Based on project formulation studies, the least costly alternative to the Tocks Island project which would provide the same quantity of water supply storage within the same service area would entail the construction of a joint reservoir system with a major dam at Wallpack Bend on the Delaware and a secondary dam along the Flatbrook in New Jersey. Estimated water supply storage costs at this alternative site are about 3 times greater than at Tocks Island. A single desalination plant, based on maximum daily plant outputs and related costs expected within the near future, would not approach the daily water supply output and related costs of the Tocks Island Lake project.

Regarding water quality in the river, low-flow control provided by the impoundment will enhance the quality of the river and estuary. This has been demonstrated in the EPA (formerly FWPCA) report in 1966. The location of the lake with respect to the estuary and the stream assimilative capacity would preclude the alleged problem due to the passage of nutrients. The State of Delaware has collaborated in setting the release program appropriate to the nutrient needs of the Delaware Bay estuary.

DRAWDOWN AND EFFECT ON ECOSYSTEM

With regard to drawdown and the effect on the ecosystem, the operating program of the lake has been physically modeled, mathematically modeled, and conceptually studied by biologists. The consensus is that a high quality ecosystem will be developed and maintained within the new lake. The sport fishery question was addressed at length in the July 1971 report of the U.S. Fish and Wildlife Service. The report, the work of an interdisciplinary task force, found that a good to excellent diverse fishery was anticipated for Tocks Island Lake. There will be fish passage provisions during the construction period. The design of the fish ladder has been coordinated with the affected interests through the Fish and Wildlife Technical Advisory Committee and has been specifically designed to meet their standards. The environmental effects upon the anadromous fish were detailed by the U.S. Fish and Wildlife Service in July 1971. In essence, that agency found that all suitable measures were being taken to protect the fishery in and near the lake project. Similar facilities are presently working well with shad on the Columbia and Snake Rivers.

Allegations that recreational value of the lake will be impaired are not correct. Ecologic studies to date demonstrate that under the most conservative assumptions the recreational values of the lake will not be compromised. Specifically, concerning algal blooms, it has been

demonstrated that under conservative assumptions there may occur blooms of about 2 weeks duration in some water years in the April or October period; such blooms if they occur would be confined to isolated scattered areas in portions of the lake not intended or developed for popular recreational purposes. The DRBC has demonstrated its intent and program to protect the lake water quality for all uses. The mud-flat question has been resolved through the cooperative master plan which will be displayed for the information of all interests, especially local citizens, upon its completion in 1973.

LAND ACQUISITION POLICY

Senator BIBLE. We have received testimony from Mrs. Mina Haefele regarding the land acquisition policy of the Corps of Engineers at the Tocks Island dam and Delaware Water Gap National Recreation Area. Could you state generally the Corps of Engineers' policy with respect to the acquisition of land for those projects?

Colonel IRVING. Every tract of land required for the project is appraised by professional qualified appraisers who are specifically instructed to develop the current fair market value of the real estate involved. The fair market value is predicated upon what similar and comparable properties are selling for in the immediate area. The district engineer has utilized the services of both staff appraisers and contract appraisers. These men are qualified and experienced in appraising the types of real estate found in the Tocks Island Lake project. Every appraisal report is reviewed by staff reviewing appraisers for acceptance and compliance with professional appraisal standards. Each contract appraiser was approved by the Appraisal Division of the Office of the Chief of Engineers as to their experience and qualifications in the field of real estate appraising.

INTIMIDATION BY NEGOTIATORS

Senator BIBLE. An allegation has been made that your negotiators try to intimidate and threaten people in an effort to force them to accept low prices for their property.

Colonel IRVING. Sir, it is not the policy of the Corps or its negotiators to threaten people or force them to sell their property to the Government. It is the policy of the Corps to treat landowners with courtesy and respect. In accordance with section —(3) of Public Law 91–646, each landowner is furnished the Government's estimate of just compensation and a written statement of, and summary of the basis for, the amount estimated as just compensation. The negotiators for the Corps pursue realistic negotiations with the owners under Public Law 91–646 in an attempt to reach agreement with the landowner at a price which is fair to the landowner and to the Government. In every instance the first offer to the owner is not less than the amount of the Government appraisal. If the owner is unwilling to settle for this amount, he is encouraged to state his opinion of value and to make a counteroffer. Negotiations with all owners are continued until agreement is reached within a reasonable range of the Government appraisal or it becomes apparent that no such agreement can be reached. In the latter event, the owner is informed that the amount to be paid for the property will have to be determined by the U.S. district

court, where the owner will be able to offer evidence as to the value of his property. If condemnation is necessary, a proceeding is filed in the appropriate Federal court and the Government's estimate of just compensation, again not less than the approved appraisal, is deposited into the registry of the court. Upon proof of ownership and approval of the court, the owner may withdraw up to 100 percent of the amount deposited without prejudice to his right to contest the Government's estimate at a trial on the issue of just compensation.

LANDOWNER TREATMENT EQUAL

Senator BIBLE. Are all people treated the same with respect to the price paid for their property?

Colonel IRVING. Yes, sir; they are. This price is based upon an appraisal estimate prepared by a Government appraiser. The landowner or his representative is invited to accompany the appraiser during his inspection of the property in order to point out all terms of value. The appraisal estimate is developed on the basis of concepts of fair market value as defined by the Federal courts. Many variable factors are considered in estimating the value of property to be acquired by the Government, such as the location of the given tract of land, availability of access thereto, productivity and topography of the land, condition and potential utilization of the soil, type and condition of the improvements, if any, and any other factors which may contribute to its desirability and salability. Each completed appraisal estimate is reviewed by a senior reviewing appraiser to assure that the appraisal is properly prepared, adequately supported by open market transactions and consistent with the appraisals of other similar properties. Analysis of the specific cases cited by Mrs. Haefele shows that the properties are not comparable. Each property was appraised on the basis of its highest and most profitable use. Any discrepancy in the prices paid for the property is explained by reference to the elements upon which the appraisals are based. We are unable to identify the retired widow referred to by Mrs. Haefele. However, we know of no case where a statement has been made that legislation providing for life rights has been repealed. In all cases where the property falls within the National Recreation Area and will not interfere with the operation of the park, life rights have been granted in accordance with Section 2(d) of Public Law 89–158. With regard to the example referred to where a couple is told they must accept our offer or they will be offered less, it is not our policy to state that a party must accept our offer; however, during negotiations for purchase our offer may exceed our approved appraisal. If we cannot agree as to the price to be paid for the land and it is necessary to file a condemnation proceeding, the deposit of just compensation for the property is based on the approved appraisal which may be less than our final offer to the property owners. This fact is related to the property owners.

RIGHT-OF-PROPERTY POLICY

Senator BIBLE. Can you explain your policy regarding the right of property?

Colonel IRVING. Senator, for each and every instance unless otherwise needed for project purposes, every property owner is given the oppor-

tunity to salvage improvements located on his property. Once the property has been obtained by purchase or final judgment has been entered in a condemnation case, we must dispose of the property by putting it up for bid to the general public. We are unable to identify the two examples cited by Mrs. Haefele; however, our policy is to be liberal in granting extensions of time for salvage by the former owner.

Senator BIBLE. Colonel Irving, Mrs. Haefele has alleged that employees of the National Park Service have salvaged improvements or property from buildings being preserved or up for sale. Do you have any knowledge of such instances?

Colonel IRVING. If personal property is abandoned by the former occupant, it is the policy to remove any salvageable items which are needed for the project. In no case is any Government employee authorized to remove any item for personal use. All salvage determinations are coordinated with the National Park Service. The specific case referred to regarding Mayor Raymond Fuller and his wife was tract 7601, owned by Mrs. Mary A. Porter, widow. During negotiations on October 17, 1972, Mrs. Porter declined salvage on her property. In February 1973, shortly before vacating the property, Mrs. Porter called the project office and requested salvage rights, stating she had a person who was interested in removing the salvage immediately. She was advised that since title had passed to the Government she would have to bid on the property when it was advertised. On February 13, 1973, Mrs. Porter vacated the property. Pursuant to our usual policy, the property was jointly inspected by ourselves and the National Park Service to see if there is any equipment usable for the project.

A number of usable items were removed by the National Park Service in this case—the electric stove, hot air furnace, shallow well pump, deep well pump, cabinets, outside lights, hot water heater, screens, copper pipe, base cabinets, sink and counter—and, I understand, are being used for the development of the area. Since the statements relate to alleged wrongdoing by employees of the National Park Service, we have referred them to that agency for investigation and report to your committee.

GRANTING OF LEASES BACK TO OWNERS

Senator BIBLE. What is the policy of the Corps of Engineers regarding the granting of leases back to the former owners of property acquired for the project?

Colonel IRVING. It is the policy of the U.S. Army Corps of Engineers to permit former owners of properties acquired for the Tocks Island Lake project to retain possession and to continue existing agricultural operations for 1 year after legal title vests in the United States. This enables the former owners to find replacement properties and to achieve an orderly relocation. In the Tocks Island Lake area, but not the Delaware Water Gap National Recreation Area, we may lease properties to their former owners or tenants of former owners who occupied the properties at the time of acquisition. Such leasing is on a year to year basis until the properties are required for project purposes. In the case of former owners, the leasing commences after the year of reserved possession. The policy with regard to the leasing back of properties acquired for the Delaware Water Gap is a matter for determination by the National Park Service, since as soon as we acquire property for that project it is turned over to them.

Senator BIBLE. What is the policy followed as to the management of areas acquired pending completion of the project?

Colonel IRVING. Because of the delay in construction of the dam the Corps has granted a permit to the National Park Service for the management and protection of lands acquired for the Tocks Island project to be used in conjunction with lands acquired for the national recreation area. Thus, these lands are now available for public use.

Senator BIBLE. What is the policy of the Corps of Engineers as to preservation or destruction of buildings on areas acquired for the project?

RESPONSE TO LETTER OF MINA HAEFELE BY NATIONAL PARK SERVICE

Colonel IRVING. Our experience has shown that it is necessary to remove structures which have been vacated by former owners in order to prevent the vandalism and illegal occupancy of abandoned structures. The removal of these buildings has greatly reduced these activities. This has been the policy with respect to lands acquired for the Corps project. Since many of the matters raised in Mrs. Haefele's statement concern employees of the National Park Service, we have furnished them a copy of her statement and our reply so that they may provide the answers directly to you.

[The response follows:]

United States Department of the Interior

NATIONAL PARK SERVICE
WASHINGTON, D.C. 20240

A3615-LOS(NER-MR)

JUL 20 1973

Honorable John C. Stennis
Subcommittee on Public Works, AEC
Committee on Appropriations
United States Senate
Washington, D.C.

Dear Senator Stennis:

This will respond to a statement made by Mrs. Mina Haefele before the House and Senate Subcommittees on Public Works Appropriations on May 14, 1973, regarding matters relating to the Tocks Island Dam and the Delaware Water Gap National Recreation Area.

Our response to the allegations contained in Mrs. Haefele's statement relating to the National Park Service and its employees at Delaware Water Gap is enclosed.

We welcome the opportunity of clearing up this misunderstanding regarding management of the Delaware Water Gap National Recreation Area.

Sincerely yours,

Raymond L. Freeman

Associate Director

The following are responses to allegations of Mrs. Mina Haefele concerning the Delaware Water Gap National Recreation Area:

Allegation: There has been questionable, and in some instances, illegal removal of salvage by Government employees.

Response: The Corps of Engineers has amply supplied facts concerning the example regarding Mayor Raymond Fuller. All of the items salvaged have been reinstalled in other Government buildings in the recreation area. The other example cited was brought to the Superintendent's attention by Mr. and Mrs. Haefele during their visit to his office on February 9, 1972. They stated that they had photos showing the alleged misconduct and would be glad to bring them to his office the following week to receive his report on an investigation that he stated would be made. The allegations were investigated and it was established that neither the alleged Government truck nor any personnel were involved. To date Mr. and Mrs. Haefele have not delivered the promised pictures or asked for the promised report. The removal of any property, personal or real, for other than official project purposes has never been authorized. Any National Park Service employee who is apprehended while removing salvage for other than official use is just as guilty as any other person and will be treated in exactly the same manner.

Allegation: There has been a discriminating and capricious policy of granting leases.

Response: The Corps and the Service have different policies regarding leases. The Service does not lease back properties to former owners and tenants as the Corps does. The National Park Service experimented in two instances with a procedure of issuing a Special Use Permit to former owners or tenants to provide specified protection, maintenance, repair and restoration for buildings identified to be retained for project purposes in exchange for the occupancy of the buildings. This caused misunderstanding and complaint from local officials so it has been abandoned. A limited number of Special Use Permits have been issued to former owners or tenants to authorize certain farm operations that are part of the resource management program for the area and to perform field mowing. These practices are required to retain scenic and environmentally desired values. These are usually of short duration and of an interim nature only until adequate equipment and staff are available to perform such work by maintenance staff.

Allegation: There has been serious degradation of the area.

Response: The significance of degradation appears to be largely a matter of opinion as many commendations on the slow but steady removal of sign boards and improvements are regularly received.

The scattered ownership of public property, the lack of adequate funds for site restoration work, and the slow disposal processes of salvage by former owners and salvage purchasers result in eyesores for longer than desirable in many cases. It might be helpful in some cases if roads could be closed or at least controlled by the National Park Service, but this is not possible as long as they remain State, county, and township roads. To date, only 10 of the 233 miles of roads within the authorized boundaries are under National Park Service jurisdiction. This also makes it impossible to establish the suggested controls at entrance points to the area. The enforcement of camping only at designated locations is being systematically approached by the liberal use of warnings for the purpose of educating people away from their long established habits of camping at random. A number of hike-in and group campsites with sanitary facilities have been established. In October 1972, ten additional permanent Park Ranger and Technician positions were added to the staff. This has enabled an extension of the coverage of our law enforcement patrols to 16 hours a day, seven days a week. This will continue on a year-round basis. Since these additional patrols have been instituted, there has been a noticeable improvement in the control of vandalism, illegal camping and trespassing. Many more of the visiting public are being contacted and informed of our regulations, and the situation has been improved since the conditions mentioned by Mrs. Haefele.

The National Park Service has made extensive surveys and evaluation of hundreds of structures within the two projects to identify all potential historical, cultural and aesthetic values and both agencies have made every effort to find contemporary project uses for such structures so their retention can be justified. Few structures with important values have been identified, and these will be preserved if at all possible--some by moving to new locations and some remaining in their present locations. The approved master plan and the policies of the National Park Service require the preservation of the cultural and scenic values of the area, and while the available processes and resources are often less than adequate the fullest possible efforts continue toward this objective.

Trexler Lake, Pa.

Senator Bible. There is nothing in the budget, and local interests have requested funds to initiate land acquisition. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $1 million to initiate land acquisition and construction.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Trexler Lake, Pennsylvania

Summarized Financial Data:

Estimated Total Appropriation Requirement		$22,800,000
Future non-Federal Reimbursement	13,065,000	
Estimated Federal Cost (Ultimate)		9,735,000
Estimated non-Federal Cost		13,065,000
Reimbursement:		
Water Supply	13,065,000	
Total Estimated Project Cost		22,800,000
Allocations to date		900,000
Balance to Complete		21,900,000
Amount that could be used in FY 1974		1,000,000

Authorization: 1962 Flood Control Act

Location and Description: The project is on Jordan Creek, a tributary of the Lehigh River in the Trexler, Pennsylvania, State Game Preserve, in Lehigh County, about eight miles northwest of Allentown, Pennsylvania. The plan of improvement now recommended will consist of a rolled-earth and rockfill embankment 820 feet long and 130 feet high providing a storage capacity of 39,000 acre-feet of which 800 acre-feet would be inactive storage, 24,200 acre-feet for supplies of water and recreation and 14,000 acre-feet for flood control.

Proposed Operations: The amount of $1,000,000 would be used to initiate land acquisition and construction.

Justification: The lake will control the runoff from a drainage area of 52 square miles and will provide benefits for supplies of water, flood control and recreation. The flood control storage will contribute to flood stage reductions at the principal damage centers of Allentown, Bethlehem and Easton, Pennsylvania. Combined operation of storage allocated to flood control at the Beltzville, Aquashicola and Trexler projects in the Lehigh River Basin would result in a flood stage reduction at Bethlehem, Pennsylvania, of about two feet for a flood similar to that experienced in 1955.

Trexler Lake will provide a dependable yield of 60 cfs for supplies of water to meet needs in the Bethlehem area and the Trenton-Philadephia area.

Trexler Lake will provide a directly related recreation capacity of 177,200 visitors annually. The scheduled construction of additional facilities by local interests will increase this capacity to 312,500. The benefit-to-cost ratio for the project is 1.6 to 1. Average annual benefits are estimated at $1,624,000 as follows:

Flood Control	$455,000
Water Supply	938,000
Recreation	231,000
Total	1,624,000

COOPER RIVER, CHARLESTON HARBOR, S.C.

Senator BIBLE. The budget request was $150,000. The House committee has allowed $150,000, and local interests have requested $352,000. What is your capability on this project?

General MORRIS. Our capability on this project is $352,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $202,000?

General MORRIS. The additional amount would be used to complete preconstruction planning approximately 1 year earlier.

MURRELLS INLET, S.C.

Senator BIBLE. Budgetary reserve will be available in fiscal year 1974, but there was no budget request.

Local interests have requested $80,000. What is your capability on this project?

General MORRIS. Our capability on this project is $80,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $80,000?

General MORRIS. The additional amount would be used to continue preconstruction planning.

CORDELL HULL DAM AND RESERVOIR, TENN.

Senator BIBLE. The budget request was $2,200,000. The House committee has allowed $3,700,000, and local interests have requested $3,700,000. What is your capability on this project?

General MORRIS. Our capability on this project is $3,700,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $1,500,000?

General MORRIS. The additional amount would be used to advance completion of recreation facilities by 1 year. There would be no advance of the overall project completion date.

AQUILLA LAKE, TEX.

Senator BIBLE. The budget request was $100,000. The House committee has allowed $200,000 and local interests have requested $250,000. What is your capability on this project?

General MORRIS. Our capability on this project is $250,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $150,000?

General MORRIS. The additional amount would be used to advance completion of preconstruction planning 8 months.

AUBREY LAKE, TEX.

Senator BIBLE. The budget request was $150,000. The House committee has allowed $277,000, and local interests have requested $277,000. What is your capability on this project?

General MORRIS. Our capability on this project is $277,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $127,000?

General MORRIS. The additional amount would be used to complete preconstruction planning in fiscal year 1974.

BIG PINE LAKE, TEX.

Senator BIBLE. The budget request was $100,000. The House committee has allowed $100,000, and local interests have requested $175,000. What is your capability on this project?

General MORRIS. Our capability on this project is $175,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $75,000?

General MORRIS. The additional amount would be used to advance completion of preconstruction planning 3 months.

CLEAR CREEK, TEX.

Senator BIBLE. The budget request was $50,000. The House committee has included $50,000, and local interests have requested $100,000. What is your capability on this project?

General MORRIS. Our capability on this project is $100,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $50,000?

General MORRIS. The additional amount would be used to advance completion of preconstruction planning 6 months.

CORPUS CHRISTI SHIP CHANNEL, TEX. (1968 ACT)

Senator BIBLE. The budget request was $3,100,000. The House committee has included $3,100,000, and local interests have requested $6,300,000. What is your capability on this project?

General MORRIS. Our capability on this project is $6,300,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $3,200,000?

General MORRIS. The additional amount would be used to provide a 45-foot channel to Corpus Christi 6 months earlier and advance completion of the project 6 months.

DUCK CREEK, TEX.

Senator BIBLE. The original budget request was $700,000. The House committee has included $450,000, and local interests have requested $700,000? What is your capability on this project?

General MORRIS. Our capability on this project now is $450,000, Mr. Chairman due to unanticipated delays in the project.

FREEPORT AND VICINITY, TEX.

Senator BIBLE. The budget request was $700,000. The House committee has included $950,000. What is your capability on this project?

General MORRIS. Our capability on this project is $1,200,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the $250,000 added by the House committee?

General MORRIS. The additional amount would be used to continue construction of the levees.

GUADALUPE RIVER (REMOVE LOG JAMS), TEX.

Senate BIBLE. There is nothing in the budget, the House committee has allowed $100,000, and local interests have requested $100,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $365,000 to initiate and complete construction.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

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Project: Guadalupe River (Remove Log Jams), Texas

Summarized Financial Data:

Estimated Federal Cost		$ 390,000
Estimated non-Federal Cost		25,000
Cash Contribution	$ 0	
Other	25,000	
Total Estimated Project Cost		415,000
Allocations to Date		25,000
Balance to Complete		365,000
Amount that could be utilized in FY 1974		365,000

Authorization: 1970 Flood Control Act

Location and Description: The portion of the Guadalupe River under consideration is located in Victoria, Calhoun and Refugio Counties, Texas, and extends from the Missouri Pacific Railroad bridge at about river mile 22 to its mouth at Guadalupe Bay. The river forms the boundaries between Calhoun and Victoria Counties and between Calhoun and Refugio Counties. The project provides for the removal of log jams and snags in numerous locations along the river that restrict the flow and cause flooding on lands adjacent to the stream.

Proposed Operations: The $365,000 would be used to initiate and complete construction.

Justification: Log jams in the lower reaches of the Guadalupe River and its distributaries have been a problem to local landowners for many years. The river is a turbid, meandering, stream that traverses the open tidal marshlands of the Guadalupe Delta. The flood plain is 5 to 6 miles wide and, for the most part, is less than 5 feet above mean-sea-level. Much of the flood plain is less than 2 feet above mean-sea-level and is subject to flooding when tides are slightly above normal. Area subject to flooding consists mainly of agricultural and grazing lands. Removal of the log jams will allow flood waters to escape downstream more rapidly, thus reducing to some degree, the height of flood stages.

LAKEVIEW LAKE, TEX.

Senator BIBLE. There is nothing in the budget. Local interests have requested $3,500,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $3,500,000 to initiate land acquisition, subject to approval of the completed restudy, which is now under review in the Office, Chief of Engineers.

MILLICAN LAKE, TEX.

Senator BIBLE. The budget request was $200,000. The House committee has included $250,000 and local interests have requested $400,000. What is your capability on this project?

General MORRIS. Our capability on this project is $400,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $200,000?

General MORRIS. The additional amount would be used to advance completion of preconstruction planning 3 months.

MILLICAN LAKE, NAVASOTA RIVER, TEX.

OPPOSITION

Senator BIBLE. The Environmental Action Council of Brazos County Inc. and Mr. W. W. Humphries, secretary-treasurer of the Navasota River Improvement Association and president of the Producer Cooperative Association of Brazos County, Tex. have presented statements of their position on development of the Navasota River. Mr. Humphries objects to the interest rate of 3¼ percent being used in computing the benefit/cost ratio of the project, and recommends that a more realistic rate be applied. Will you comment?

Colonel MILLER. Mr. Chairman, this objection was raised during the Senate hearings for fiscal year 1973. Our position remains the same as stated last year. The interest rate used in economic formulation of this project is neither an arbitrary decision nor even a best judgment by the corps. The interest rate used is to be determined by regulations promulgated by the Water Resources Council pursuant to law. The regulations are published and, provided certain requirements are met, allow the interest rate for project formulation of previously authorized projects not yet under construction to be fixed at the rate prevailing in fiscal year 1968. The local sponsors of this project have complied with these special requirements. As a result, the interest rate for project formulation has been fixed at 3.25 percent, which was that in effect during fiscal year 1968. The regulations are of general applicability to all water resources projects and are being applied in a uniform manner.

Senator BIBLE. Mr. Humphries states that those organizations which so enthusiastically endorse the project have never been willing to come forward and give any reliable representation that they would obligate themselves to purchase the water in any amount at any price that would justify the project. Would you discuss this statement?

Colonel MILLER. Yes, sir. When studies have progressed to a point that project features have been finalized, further discussions will be held with the Brazos River Authority, which has stated that it will

furnish the cost sharing requirements for water supply. The Brazos River Authority is an agency of the State of Texas and is charged with certain responsibilities for the conservation, control, and development of the water resources of the Brazos River Basin. On February 8, 1965, it passed a resolution which states in part:

> That the Brazos River Authority, in furtherance of its responsibility to the State of Texas for water conservation and water resource development in the Brazos Basin, is willing to assume the obligations and requirements of the local cooperation for the water conservation portion of the project, and, at the proper time after authorization of the project by the Congress, will enter into an appropriate agreement with the Federal Government setting forth the terms and conditions for fulfilling such obligations and requirements; * * *.

STUDIES OFFER NO ALTERNATIVES TO ELIMINATE ADVERSE ENVIRONMENTAL IMPACT

Senator BIBLE. Mr. Humphries also contends these studies do not comply with the spirit, wording, and intent of the Environmental Protection Act of 1969, and do not provide for any alternatives to eliminate or diminish the adverse environmental impact of the proposed project.

Colonel MILLER. Mr. Chairman, the National Environmental Policy Act of 1969 requires adequate studies to insure an understanding of the trade-offs involved in a proposed project. It opens the decisionmaking process to critical evaluation by other agencies and the public. A systematic and interdisciplinary approach is being utilized to insure that proper consideration is being given to environmental impacts including the technical, economic, and social aspects of the project. During the project planning and related decisionmaking process, reasonable alternatives will be identified. The multidisciplinary team of scientists from Texas A. & M. conducting the environmental studies have expertise in water quality biological sciences, and parks and recreation. The historical and archeological survey of the area is being conducted by a team of archeologists from the University of Texas at Austin. Economic and hydrological studies are also being conducted. These studies will identify potential environmental problems that may require additional alternative studies.

Senator BIBLE. Mr. Humphries states land that was selling at a stated dollar value of $300 to $400 per acre is now regularly being traded at $600 to $800 per acre. Have you updated your land cost to reflect this increase in land prices?

Colonel MILLER. Sir, the project formulation portion of preconstruction planning now in process will update not only the real estate cost, but all features of the entire project. We are aware that the Navasota River basin is experiencing increases in land prices. Available information indicates that the Houston real estate market is causing much of this increase.

DETERMINATION OF ACTUAL NEED OF ADDITIONAL WATER SUPPLY

Senator BIBLE. The Environmental Action Council of Brazos County, Inc. recommends that further appropriations of moneys for Navasota River Watershed improvement be stipulated for use in the planning phase to develop answers to several questions which they have

raised. They desire that a determination be made of the actual need for additional water supply.

Colonel MILLER. Sir, we have recently completed updating a Public Health Service report dated June 1965, "Water Supply Study, Navasota River Watershed, Brazos River System." This study revealed that water supply need for the Lower Brazos River Basin and Brazoria and Galveston Counties in the adjacent coastal basin was 377 MGD in 1970; the maximum and minimum needs were estimated at 2,565 and 729 MGD in 2020 and 22,426 and 5,771 MGD in 2085. The actual needs in the future are expected to be between the estimated maximums and minimums as they depend on the recirculation of industrial water.

Senator BIBLE. What is the present yield available for these areas?

Colonel MILLER. Sir, our study shows 655 MGD is available from existing facilities. This yield will be reduced to approximately 420 MGD by 2020 because of additional upstream diversions for irrigation and the closing of a desalting plant at Freeport. The greatest needs are in the vicinity of the gulf coast where a water shortage is expected about 1980 because of the reduced yields and increased needs.

Senator BIBLE. They also recommend that actual flood and recreational benefits be determined for the Brazos River basin.

Colonel MILLER. Sir, studies are currently underway on these items.

Senator BIBLE. When do you anticipate completing these studies?

Colonel MILLER. Sir, the plan formulation portion of preconstruction planning is currently scheduled for completion in December 1974.

PROJECT BENEFITS

Senator BIBLE. They also recommend the majority of people be identified who will benefit from the Millican Dam project.

Colonel MILLER. Sir, the breakdown of total project benefits is 36 percent for flood control; 30 percent for water supply; 27 percent for recreation; and 7 percent for redevelopment. The people receiving the flood control benefits are those living in the flood plain downstream of the dam along the Navasota and the Brazos Rivers. The recreational benefits will result from public use by recreationists within the Millican Lake recreational zone of influence. The principal use will be from the College Station, Bryan, Austin, Waco, and Houston areas. Also, benefits will be realized by those who supply the support facilities for the recreating public, such as operators, employees, and owners of marinas, motels, boat docks, restaurants, and by those who provide land developments such as residential subdivisions and resorts. The 30 percent allocated to water supply was based on a study area of 21 counties in south central Texas. All 21 of these counties would receive benefits directly or indirectly from the project. The 7 percent allocated to redevelopment will generally be received by people in the immediate area of the project who, in the absence of the project, would be unemployed or underemployed.

Senator BIBLE. The Environmental Action Council asked that those persons who would be injured by the project be identified. Have you attempted to do this?

Colonel MILLER. No, sir.

Senator BIBLE. What comment do you have in response to this statement?

Colonel MILLER. An assessment of the social, economic, and environmental impacts of the project will be included in the studies presently underway and those areas affected will be made public as the study progresses. This information along with a draft EIS will be discussed at public meetings prior to the finalization of our preconstruction planning studies.

Senator BIBLE. Have you identified and investigated all alternatives?

Colonel MILLER. No, sir. That is part of the planning and environmental studies now underway. Many unknowns will be identified and investigated during these formulation studies.

ANALYSIS OF ENTIRE SYSTEM RECOMMENDED

Senator BIBLE. What is you reaction to the Council's recommendation for a multidisciplinary Brazos River basin analysis of the social, economic, and physical conditions of the entire system?

Colonel MILLER. I believe that all these points will be adequately addressed by the time we complete our planning. Section 122 of Public Law 91–611 requires consideration of the social and economic aspects of the project. Certainly, much attention has been given to the physical, environmental, and economic conditions and will continue throughout the planning process.

Senator BIBLE. Do you think that the environmental studies will present a valid inventory of the Navasota River ecosystem? The Environmental Action Council of Brazos County questions the validity of current investigations because of recent abnormally wet weather.

Colonel MILLER. Yes, sir. We believe a valid environmental inventory is being obtained. The environmental inventory being conducted by Texas A&M University will include data collected over the past several years and information from published reports, together with field and laboratory data presently being collected. As an indication of the study depth, approximately 7,200 man-hours of effort by students, graduate students, and professors have been expended to date in the biological inventory portion of the study.

Senator BIBLE. What effect would the proposed Millican Dam have on the 50-year and 100-year flood on Carter Creek in College Station?

Colonel MILLER. None, sir.

Senator BIBLE. Is the Corps' new policy of "Fishbowl Planning" being carried out on this project?

Colonel MILLER. Yes, sir. In September 1972, a notice was sent to all interested individuals, agencies, and organizations inviting comments and recommendations. As a result, we have received a number of responses. The majority of responses either simply stated their support or opposition to the project. In each case where problems were pointed out or questions raised, we are working with these people to come up with an agreeable solution. As our planning progresses, we will have further meetings with people who are interested in the future environment and economy of the area.

San Gabriel River, Tex.

Senator Bible. The budget request was $3,800,000. The House committee has included $6,800,000 and local interests have requested $8,200,000. What is your capability on this project?

General Morris. Our capability on this project is $8,200,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $4,400,000?

General Morris. The additional amount would be used to advance completion of construction 6 months.

Taylors Bayou, Tex.

OPPOSITION

Senator Bible. The committee has again noted the opposition of Mr. Blackwelder of the Environmental Policy Center to the Taylors Bayou project. Addressing his first point, is the purpose of Taylors Bayou project to rescue local developers who built houses in a swamp?

Colonel Miller. Sir, the Taylors Bayou project provides for enlargement of the main streams in the 464 square miles of Taylors Bayou watershed to provide flood protection to the city of Beaumont and major drainage outlets for the remainder of the watershed. The project is planned to work in conjunction with upstream improvements either already accomplished or planned by local authorities. The flood control features of the project would provide protection from floods to the urban area of west Beaumont, an area with ground elevations varying from about 15 to 25 feet above mean sea level. Flooding of this area results from the inadequacy of the main streams to handle the excess flow delivered by the local streams and not due to its topography.

Senator Bible. Will the project drain wetlands?

Colonel Miller. No, sir; the project will not materially change the present mean water level of the bayou. The proposed improvements are designed for removal of flood and drainage waters which accumulate on the watershed faster than the existing streams can handle the flow without appreciable flooding. Deepening and widening of these streams are the only improvements being considered. Dikes, control structures, and other facilities which are generally associated with the draining of low land are not included in this project.

Senator Bible. Will the project destroy wildlife habitat?

Colonel Miller. To a limited degree, sir. Construction operations for the project would temporarily increase turbidities and sedimentation, thereby reducing the water quality of the streams and adversely affecting the sport and commercial fresh water fishing. Some temporary impairment of spawning, nursery, and foraging areas for fresh water fish would be experienced. However, channel oxbows and cutoffs would not be filled or blocked, and, together with the undredged portions of the streams in the watershed, would provide sufficient undisturbed spawning, nursery and foraging areas for the preserva-

tion of the species native to these streams. Construction operations would also require the removal of timbered areas along the streams which would detract from the natural quality that presently exists and displace some habitat for the native wildlife.

Texas City Channel, Tex. (Industrial Canal)

Senator Bible. There is nothing in the budget, the House committee has included $40,000, and local interests have requested $40,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $40,000 to initiate preconstruction planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Texas City Channel, Texas (Industrial Canal)

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$ 3,000,000
Estimated Federal Cost (U. S. Coast Guard)		65,000
Estimated non-Federal Cost		165,000
Cash Contribution	$ 0	
Other	165,000	
Total Estimated Project Cost		3,230,000
Allocations to Date		0
Balance to Complete		3,000,000
Amount that could be utilized in FY 1974		40,000

Authorization: Section 201 of the 1965 Flood Control Act (Authorized 1972)

Location and Description: The project is located in Galveston County, Texas, on the west side of Galveston Bay, about 10 miles northwest of the city of Galveston, Texas. The plan of improvement provides for widening a portion of the Texas City turning basin from 1,000 feet to 1,200 feet; for realigning the Texas City turning basin to a location 85 feet easterly from its present position; and for Federal assumption and enlargement through widening and deepening to 40 feet of the locally dredged Industrial Canal and Basins.

Proposed Operations: The amount of $ 40,000 would be used to initiate preconstruction planning.

Justification: Widening of the Texas City turning basin is necessary to accommodate existing and prospective traffic of large tankers and bulk carriers. Widening and deepening of the Industrial Canal and deepening of the turning basin on the Industrial Canal is necessary to accommodate existing and prospective vessel traffic of tankers. Tankers are now operating light-loaded on the locally constructed Industrial Canal and basin. The prospective tonnage for the waterway is 61,575,000 in the year 2025, as compared with actual tonnage of 17,952,004 in 1971. The prospective deep draft tonnage for the Industrial Canal is 8,803,000 in the year 2025, as compared with actual tonnage of 956,000 in 1967. The benefit-to-cost ratio is 2.0 to 1. Average annual benefits, all navigation, are estimated at $538,100.

OPPOSITION

Senator BIBLE. Testimony has been received by this committee on behalf of several individuals and by U.S. Congressman Alan Steelman. Congressman Steelman introduced the following citizens who presented testimony which opposes at least some aspect of the authorized project plan: Dr. James F. White, Henry C. Fulcher, Jr., Charles Crabtree, and Betty Fischer. Their statements dealt principally with the need for the navigation channel. Also, this committee received testimony of a general nature from Brent Blackwelder representing the Environmental Policy Center and Joel M. Pickelner on behalf of the National Wildlife Federation. You have been furnished copies of the testimony and I would like your comments concerning the specific points raised by these citizens.

Colonel MILLER. Mr. Chairman, I believe the features of what is termed the Trinity River project, as well as the other projects that were a part of the overall basin development authorized in Public Law 89–298 were adequately described in last year's testimony. Therefore, if it pleases the committee, I will not take your time to again describe all of the interrelationships of the projects authorized for the Trinity Basin, but rather address the issues presented.

Senator BIBLE. You may proceed.

Colonel MILLER. Mr. Brent Blackwelder, representing the Environmental Policy Center in Washington, D.C., states that the Trinity River project should not be funded and that arguments can be presented against it on economic and environmental grounds, and in terms of national priorities. Mr. Blackwelder does not present any data to substantiate his statements; therefore, I can only respond to his statement in general terms. The environmental and economic issues are currently being addressed in our planning process. We believe that detailed data currently being analyzed will, when completed, give Congress sufficient information on which to base decisionmaking.

ENVIRONMENTAL IMPACT OF BARGE CANAL

Senator BIBLE. Mr. Pickelner, representing the National Wildlife Federation, states that it is not worthwhile to spend $1.5 billion on a project that will destroy thousands of acres of biologically rich bottomland, millions of trees, important wildlife habitat, endangered species, and archeological sites for the sake of a barge canal when the necessary transportation is already available in the form of trucks and trains.

Colonel MILLER. Environmental impacts associated with biology, wildlife, and archeology, among other things, are being studied in great detail. Our standard method of computing navigational benefits takes presently available and future rail and truck transportation facilities into full consideration. A detailed environmental impact statement will be prepared when these studies are completed. This is a very large and complex project, and we are committed to be responsive to the requirements that have been set out by law. We feel that we must be able to present detailed data concerning the several aspects

of the project and possible alternatives before substantive intelligent recommendations and decisions can be made.

Senator BIBLE. Mr. Crabtree states that the Corps of Engineers is asking for fiscal year 1974 funding to continue work on a project that the citizens of the Trinity River Basin do not want; specifically, the barge canal. He cites the results of the local referendum as evidence of this lack of local support. He also states that other purposes including water supply, flood control and recreation should be funded, but that studies associated with the barge canal should not be funded. In addition, Mr. Crabtree proposes that funds be allocated for the design of a new Trinity River project master plan with its central feature being the acquisition of the flood plain and leaving it undeveloped.

Colonel MILLER. Mr. Chairman, we are very aware of the results of that referendum. Of the $150 million connected with the bond issue, about $78 million would have provided the local interest portion for flood control and recreation purposes on the Trinity River project and on two other projects: the Elm Fork floodway and Duck Creek channel improvement. So there is more involved here than just a lack of local support for navigation on the Trinity. The Trinity River project was authorized by Congress in 1965 and funds appropriated to commence preconstruction planning in fiscal year 1970. As part of this planning, each authorized project purpose is being reexamined in detail to determine its need, engineering and economic feasibility, environmental impact and the willingness for local support and financial cooperation. Flood plain management will be assessed as well as no-action alternatives for the other project purposes. At the present time, we are in no position to recommend deauthorization or deferral of project elements or, for that matter, construction of the authorized plan.

REDUCTION IN PLANNING ITEMS

Senator BIBLE. Dr. White and Mr. Fulcher request that certain planning items in the budget should be eliminated or reduced; specifically, those relating to navigation.

Colonel MILLER. Mr. Chairman, in order for a plan to be developed which is responsive to our direction from the Congress and the needs of the people, funds should be made available to continue planning. The items of study currently underway that relate to navigation are necessary to determine what is feasible from a physical construction standpoint. This is the first step prior to an economic or environmental evaluation. We are developing those alternatives which would be probable solutions to currently expressed and projected basin needs. The best of the alternatives can then be developed and the economic and the environmental effects can be assessed.

I would add that there has been some confusion about what this project would look like without navigation. Along much of the route, the size of the channel required for flood control is nearly identical to that required for the multipurpose navigation project.

Senator BIBLE. Dr. White and Mr. Fulcher request that funds not already committed for construction of high-level bridges be eliminated from the budget. Dr. White specifically mentions the deletion of funding for the bridge on Texas State Highway 105.

Colonel MILLER. Funds for the advance participation on high-level bridges are budgeted separately from the Trinity River project. The

additional cost of constructing these bridges initially to meet navigation and flood control requirements of the future channel was significantly less than the cost of altering these bridges at a future date during channel construction. All of these bridges were going to be replaced or have some modification work prior to our involvement in raising them. Currently, all but the State Highway 105 bridge are completed or under construction contract. In our current Trinity River project studies, we have been pursuing for about 9 months a study of realinement of the channel in the lower reaches of the river which involves the State Highway 105 crossing. Actual construction of the Highway 105 bridge is under consideration pending completion of the channel alinement study and coordination with the agencies involved.

Wallisville Lake, Tex.

Senator Bible. The original budget request was $3,100,000. The House committee has included $3,100,000, and local interests have requested $3,100,000. What is your capability on this project?

General Morris. We have no capability on this project. All construction on the project has stopped due to a court injunction issued by the U.S. District Court in Houston, Tex. Any further work which we may be permitted to accomplish in fiscal year 1974 prior to resolution of the court injunction would be accomplished with carryover funds.

Gathright Lake, Va.

opposition

Senator Bible. Mr. Brent Blackwelder representing the Environmental Policy Center contends that the water quality benefits used to justify the Gathright Lake project come from flushing out the pollution from a papermill downstream. Would you comment on this?

Colonel Irving. Yes, sir, project justification is based on benefits derived from prevention of flood damages, increased water-oriented recreational opportunities, and improved water quality in more than 300 miles of the Jackson and James Rivers by augmenting natural streamflows during drought periods. At present there is a need for low flow augmentation to alleviate the effects of point source discharges from municipalities and industries along the Jackson and James Rivers. Testimony presented at the trial in March 1973, U.S. District Court for the western district of Virginia, indicated that the water quality storage in Gathright would be needed even if these point source discharges were eliminated.

Senator Bible. Testimony presented by Mr. Blackwelder indicates the presence of porous limestone conditions at the dam site. Will this require additional work, if so, will it affect the benefit-cost ratio?

Colonel Irving. Limestone tunnels and cavities have been encountered in the abutments of the dam and will require some additional excavation, drilling, and grouting to provide a suitable foundation for the dam.

The estimated cost of this additional work, now under contract, is based on the low bid received December 14, 1972, and has already been reflected in the benefit-cost ratio presented in support of the fiscal year 1974 budget request.

DESTRUCTION AND FLOODING OF GORGE AND WILDLIFE AREA

Senator BIBLE. Mr. Blackwelder indicated that the dam would destroy a beautiful 12-mile river gorge and flood 1,700 acres of prime wildlife lands in the Gathright Wildlife Management Area. Would you care to comment?

Colonel IRVING. Yes, sir, in accordance with the National Environmental Policy Act of 1969 (Public Law 91–190), a final environmental impact statement for the Gathright Lake project has been circulated and filed with the President's Council on the Environment. Adequacy of the impact statement has been upheld in litigation occurring in March 1973, U.S. District Court for the Western District of Virginia. A supplement of the EIS addressing the effects of the 1972 Clean Water Act has been filed with CEQ and copies provided to the Appropriations Committees. The Corps and many supporters of the project believe that the value of the free-flowing reach of the Jackson River and portion of the Gathright Wildlife Management Area to be replaced by 2,530-acre lake will be more than offset by project operational benefits and high quality recreational opportunities. Actually, the gorge occupies only about 1½ miles of the referenced 12-mile reach.

SALEM CHURCH LAKE, VA.

OPPOSITION

Senator BIBLE. We have received a statement from the State Water Control Board of the State of Virginia on the Salem Church Lake project and also had entered into the record a memorandum dated October 4, 1972, to the members of the board. The board recommended that this project as presently designed and conceived be terminated. Would you comment on this?

Colonel IRVING. Yes, sir, we were concerned upon hearing of the State Water Control Board recommendation but are convinced that our respective positions regarding the Salem Church project are based on different sources of data or basic misconceptions. Our review indicates that there is a valid requirement for water that can be supplied from Salem Church and that this requirement is an urgent one in terms of the time required to develop these resources. We do not believe that there is a conflict between the need for Salem Church and the need for development of the Potomac; in fact, both are needed as quickly as they can be provided. Despite the controversial aspect of water quality control there are real benefits to increasing low flows during drought periods.

The service area for the 119 Mgal/d of water supply in the Salem Church project does not include any of the area cited in the board comment except for Fauquier County. Distribution of the 119 Mgal/d in the Salem Church project is as follows:

	Amount in Mgal/d
Area:	
Prince William County	70
Spotsylvania County	9
Fredericksburg	14
Fauquier County Water and Sanitation Authority	26
Total	119

Water supply for the Fauquier County area has been included in the project despite opposition to the project by the Fauquier County Board of Supervisors, because the Fauquier County Water and Sanitation Authority did request water supply storage in 1965 and subsequent reports have indicated that a need still exists.

The assumption that $100 million will be expended so that water from Salem Church can be pumped to the Dalecarlia treatment plant on the Potomac and then back to such areas as Prince William County for use is not considered a realistic assessment of conditions. It is questionable that surplus capacity of the treatment plant on the Potomac is adequate to meet the future needs of the area, as the analysis tends to infer, and even if this were the case treatment facilities nearer the source would seem a more practical arrangement.

WATER WORKS PROJECT, STAFFORD COUNTY, VA.

The Corps of Engineers is not alone in recognizing the need for a major impoundment on the Rappahannock River. Governing bodies of communities and counties adjoining the Washington metropolitan area have had consulting engineers review the water situation, and as a result have officially requested large blocks of storage in the Salem Church Reservoir to meet their needs for water supply in the foreseeable future. Russell, Axon & Associates in their report "Feasibility Study Water Works Project, Stafford County, Virginia," December 1964, stated:

It is evident that the Rappahannock River and its tributaries will eventually become the backbone of the major water supply to a large group of counties located near the river * * * The great problem in damming the Rappahannock River is that of financing an initial project large enough to utilize the vast storage areas available * * *. It should be apparent * * * that (the) counties will need a reservoir on the Rappahannock River during the foreseeable future. It is also evident that no one county can alone finance the type and size of dam that will eventually be needed. It is almost obvious that the initial dam on the Rappahannock should be as large as possible in order to insure that storage areas are used. Using this process of logical deduction, it becomes apparent that any reservoir project on the Rappahannock must be a joint effort of all the affected counties. The next logical conclusion is that there must be some overall coordinating agency to initiate such a project. * * *

* * * It is not within the scope of this report or the prerogative of the County's Engineers to discuss the merits of the proposed Salem Church Reservoir, or to discuss the purposes and uses of such a reservoir; however, several obvious facts are basic:

1. There will be a future need for a major water supply reservoir on the Rappahannock River.

2. The reservoir will become more and more expensive to build with each succeeding year.

3. A large Federal agency, such as the Corps of Engineers, will be needed to correlate a project of such enormous proportion.

4. Federal government participation in costs will be an absolute necessity for the project to become a reality.

5. With major participation from Federal funds, the project cannot help being of greater value to northern Virginia than the funds contributed locally.

In view of these basic facts, the Engineers recommend wholehearted cooperation by all of the counties in the Rappahannock Basin to assist the Corps of Engineers in arriving at a reservoir project that is beneficial to all concerned.

FUTURE WATER SUPPLY FOR PRINCE WILLIAM COUNTY, VA.

Colonel IRVING. Wiley and Wilson in "A Comprehensive Report on Future Water Supply for Prince William County, Va.," April 1966, stated:

> With the ultimate development of the Salem Church project being inevitable, due to the numerous requirements for such a reservoir, an ideal situation develops to allow the diversion of water into the Occoquan watershed when and if ever needed. Such a diversion would provide practically an unlimited source of raw water for the Occoquan Creek to meet all predictable demands upon this stream. The Salem Church Reservoir potential makes even more feasible the development of Lake Jackson in combination with the Cedar Run impoundment above Brentsville. By the Lake Jackson-Cedar Run impoundment, a reservoir approximately 12 miles in length would be created which would serve as a channel for delivering Salem Church water to the heart of Prince William County with the minimum use of pipelines * * *. This source would be far superior to the plan of reaching to the Potomac River in Loudoun County as a source of supply, which involves a long supply main approximately 16 miles just to reach the border of Prince William County * * *.
>
> * * * The Salem Church Reservoir supply also offers the possibility of water being delivered from this source to meet requirements of Fairfax County areas adjacent to Prince William County.

It does not appear that the method selected for solving the water supply problems of the Washington metropolitan area would nullify the need for the Salem Church project, nor does it appear that the urgency can be overstated for reaching a decision on this project. With Interstate 95 close to the expanding suburbs of the adjacent metropolitan areas, homes, cottage sites, and real estate development will occur along the rivers in the foreseeable future. If Salem Church at some scale is not developed now, it is not likely to be in the future. Expansion pressures in the area are so great that the priority for the use of the lands must be established now. In the absence of Salem Church, even the opportunity to preserve natural values will be lost unless positive action is taken and funds made available in the immediate future.

POTENTIAL OF UPSTREAM RESERVOIRS

Upstream reservoirs have a greater potential to provide water for municipal and industrial use and for improving water quality over a larger area than reservoirs at the fall line. The major problem area; however, appears to be near the estuary; but there also appears to be a need for upstream storage in the Potomac Basin as well as storage near the estuary on the Rappahannock River. Since these developments do not serve the same needs, there does not appear to be any real conflict between Salem Church and the projects in the Potomac River Basin.

The board also raised the question of legal status of the project. The Virginia Attorney General's opinion of April 25, 1972 may be correct as a question of State common law, but it does not apply to the superior commerce clause powers exercised by Congress in constructing a dam.

In *Arizona* v. *California*, 373 U.S. 596, 587 (1963), the U.S. Supreme Court recognized that the authorization for the construction and operation of such projects was enacted "in the exercise of con-

gressional power to control navigation, power generation, and other objects, and is equally sustained by the power of Congress to promote the general welfare through projects for reclamation, irrigation, or other internal improvements. Where the Government, as here has exercised this power and undertaken a comprehensive project for the improvement of a great river and for the orderly and beneficial distribution of water, there is no room for inconsistent State laws." See generally, *United States* v. *Chandler-Dunsan Water Power Co.*, 229 U.S. 53, 57 L. Ed. 1063, 33 Sup. Ct. 667 (1913) and *United States* v. *Genlach Live Stock Co.*, 339 U.S. 725, 94 L. Ed. 1231, 70 Supp. Ct. 955 (1950).

BASIC AUTHORITY OF CONGRESS

We therefore respectfully disagree with the Attorney General's opinion and conclude that Congress, in the exercise of its superior, constitutional powers has the basic authority to distribute the waters of the Salem Church Lake as, in wisdom, it sees fit, and that the total or partial destruction of private, riparian rights in the flow of the stream is not compensable.

It is questionable that there would be any downstream objections to the diversion of water from Salem Church, particularly if downstream releases during drought periods are greater than would have occurred naturally.

The Corps has no authority to include in the project costs the estimated $6 million the State water control board concluded would be necessary to improve upstream water quality. However, we do not agree that it is a project related cost.

The EPA in its report of January 1971, did not conclude that it would be necessary to provide any unplanned upgrading of treatment plants at the upstream communities. The EPA concluded that:

> Nutrients discharged by the upstream communities of Culpeper, Warrenton, Remington, Orange, and Madison pose potential problems to the recreational usage of the proposed Salem Church Reservoir. Post-operative surveillance measures would be necessary to determine nutrient levels in the proposed reservoir and to initiate action toward provision of adequate nutrient removal facilities at these communities if there is indication of euthrophication attributable to these sources.

The EPA found that the Rappahannock River is intermittently degraded downstream from the community of Remington and that localized degradation has been experienced in Mountain Run, downstream from the waste discharge at Culpeper. This would indicate some upgrading of these treatment facilities may be necessary in the absence of Salem Church.

In summary, the Corps of Engineers does not feel, at this time, that it has been clearly demonstrated the higher degrees of treatment will be necessary as a result of constructing the Salem Church project.

PROJECT RECREATIONAL ASPECTS

The recreational aspects of the project were studied by a special recreation committee formed from representatives of Federal and State agencies as well as conservation groups. While all members of the group did not agree that a dam should be constructed at the Salem Church site, everyone agreed that there was a need for additional

water-oriented recreational opportunities in the area. It was also determined that recreational development at Salem Church would be less costly than the alternative development on the Potomac Estuary.

It is not clear how the need for an impoundment at the Salem Church site has been mullified by new considerations and information which have come to light in the last year as has been alleged. The proposed project has the potential to provide a high degree of positive flood protection to the Fredericksburg area, to augment the natural flows of the stream during drought periods, to provide some 5 to 6 million man-days of recreational opportunities annually, to enhance oyster production in the lower estuary, and to provide a dependable source of water supply for about 700,000 people. The Salem Church project will, of course, not solve the future water supply needs of northern Virginia; however, utilizing some of the storage in this project to meet a portion of the needs is considered a reasonable use of resources.

With regard to other studies in the basin to solve specific problems, the Corps of Engineers studied the flood situation along the Rappahannock River from Embrey Dam downstream to Muddy Creek at the Stafford-King George County line. A flood plain information report on this reach of river was presented to the city of Fredericksburg and the counties of Spotsylvania and Stafford in September 1970. Alternative solutions to flood problem in this area were studied during review of the Salem Church project. These studies indicated that there were no viable alternatives for this objective. It is therefore unlikely that further study of this problem by the Corps would produce favorable results.

EDIZ HOOK, WASH.

Senator BIBLE. There is nothing in the budget, and local interests have requested $200,000. What is your capability on this project?

General MORRIS. Mr. Chairman, this project is not yet authorized. If the project is authorized during the current session of Congress, our capability on this project would be $200,000 to initiate planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Ediz Hook, Washington

Summarized Financial Data:

Estimated Federal Cost		$5,190,000
Estimated non-Federal Cost		384,000
Cash Contribution:	$384,000	
Other Costs	0	
Total Estimated Project Cost		$5,574,000
Allocations to Date		0
Balance to Complete		$5,190,000
Amount that could be utilized in Fiscal Year 1974		$ 200,000

Authorization: Not yet authorized

Location and Description: Ediz Hook is located adjacent to the city of Port Angeles, along the Strait of Juan de Fuca, in Challam County, Washington, about 100 miles northwest of Seattle. The plan of improvement provides for construction of 10,000 lineal feet of rock revetment, beach replenishment and annual nourishment.

Proposed Operations: If the project is authorized during the current session of Congress the amount of $200,000 could be used to initiate preconstruction planning.

Justification: Ediz Hook is a natural peninsula which provides protection to the natural deep-draft harbor at Port Angeles. A Coast Guard station is located on the outer end of Ediz Hook. In the past, adequate littoral material was provided to maintain the integrity of the Hook. However, in recent years, private developments to the west of the Hook have interfered with the source of littoral material and, consequently, Ediz Hook is no longer naturally sustained. Without provision of adequate protection and nourishment Ediz Hook will be breached, destroying the land connection between the mainland and the Coast Guard Station, and subjecting harbor facilities to severe damage. Without the protection provided by Ediz Hook the Port Angeles Harbor would be unusable. The benefit-to-cost ratio is 15.8 to 1. Average annual benefits are listed below:

Annual Benefits	Amount
Navigation	$7,196,000
Beach Erosion	534,000
TOTAL	$7,730,000

Little Goose Lock and Dam (Lake Bryan), Additional Units, Wash.

Senator Bible. There is nothing in the budget, and local interests have requested $450,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $450,000 to initiate construction.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Little Goose Lock and Dam (Lake Bryan), Additional Units, Washington

Summarized Financial Data:

Estimated Total Appropriation Requirement	$34,100,000	
Future Non-Federal Reimbursement	$34,100,000	
Estimated Federal Cost (Ultimate)		0
Estimated Non-Federal Cost		$34,100,000
Reimbursement: Power	$34,100,000	
Cash Contribution: None		
Other Costs: None		
Total Estimated Project Cost		$34,100,000
Allocations to Date		$271,000
Balance to Complete		$33,829,000
Amount that could be utilized in FY 1974		$450,000

Authorization: River and Harbor Act of 1945 (HD. 704/75)

Location and Description: Little Goose Lock and Dam is located on the Snake River, at river mile 70.3, about 70 miles northeast of Pasco, Washington. The plan of improvement provides for completion of the existing powerhouse and installation of three additional generating units of 135,000 kw each.

Proposed Operations: The amount of $450,000 could be used to initiate construction.

Justification: Load resource studies prepared by the Bonneville Power Administration demonstrate development of a precarious power shortage in the Pacific Northwest. The growth of power requirements in this region will require development of large thermal power facilities which must be supplemented with additional hydropower capacity if regional power needs are to be met in an economical and efficient manner. Installation of three additional units at Little Goose, with a total installed capacity of 405,000 kw, will provide an essential part of the generation capacity required of the Federal system by the 1978-79 power season and thereafter. The benefit-to-cost ratio is 7.4 to 1. Average annual benefits, all power, are estimated at $18,367,000.

Lower Granite Lock and Dam, Washington (Additional Units)

Senator Bible. There is nothing in the budget, and local interests have requested $450,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $450,000 to initiate construction.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Lower Granite Lock and Dam, Washington (Additional Units)

Summarized Financial Data:

Estimated Total Appropriation Requirement		$34,100,000
Future non-Federal Reimbursement		$34,100,000
Estimated Federal Cost (Ultimate)		0
Estimated non-Federal Cost:		34,100,000
Reimbursement: Power	$34,100,000	
Other Costs:	None	
Total Estimated Project Cost		$34,100,000
Allocations to Date		320,000
Balance to Complete		$ 33,780,000
Amount that could be utilized in Fiscal Year 1974		$ 450,000

Authorization: River and Harbor Act of 1945.

Location and Description: Lower Granite Lock and Dam is located on the Snake River at the head of the Little Goose pool at River Mile 107.5, about 50 miles north of Walla Walla, Washington. The plan of improvement provides for completion of the powerhouse and installation of three generating units with a total generating capacity of 405,000 kilowatts in the existing skeleton bays of the Lower Granite powerhouse.

Proposed Operations: The amount of $450,000 could be used to initiate construction.

Justification: Installation of additional units at the Lower Granite project will be required to meet continually growing regional power needs. Load-resource studies prepared by the Bonneville Power Administration demonstrate development of a precarious power shortage, despite planned retraction of power deliveries to California and denial of additional Federal power for new industrial loads. Installation of additional units at Lower Granite will provide an essential part of the generation required by the Federal system. The benefit-to-cost is estimated at 7.4 to 1. Average annual benefits, all power, are estimated at $18,419,000.

LOWER MONUMENTAL LOCK AND DAM, WASH.

Senator BIBLE. The budget request was $1,231,000. The House has included $1,231,000, and local interests have requested $3,156,000. What is your capability on this project?

General MORRIS. Our capability on this project is $3,156,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $1,925,000?

General MORRIS. The additional amount would be used to complete our recreation facilities and to reimburse the Union Pacific Railroad for costs it incurred in protecting the Joso Bridge from the Lower Monumental pools increased water levels.

LOWER MONUMENTAL LOCK AND DAM, WASH. (ADDITIONAL UNITS)

Senator BIBLE. There is nothing in the budget, and local interests have requested $330,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $330,000 to initiate planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Lower Monumental Lock and Dam, Washington (Additional Units)

Summarized Financial Data:

Estimated Total Appropriation Requirement	$34,100,000	
Future Non-Federal Reimbursement	$34,100,000	
Estimated Federal Cost (Ultimate)		0
Estimated Non-Federal Cost:		$34,100,000
Reimbursement: Power	$34,100,000	
Other Costs: None		
Total Estimated Project Cost		$34,100,000
Allocations to Date		0
Balance to Complete		$34,100,000
Amount that could be utilized in Fiscal Year 1974		$ 330,000

Authorization: River and Harbor Act of 1945

Location and Description: Lower Monumental Lock and Dam is located on the Snake River about 41.6 miles upstream from its confluence with the Columbia River, approximately 45 miles northeast of Pasco, Washington. The plan of improvement provides for completion of the powerhouse and installation of three generating units with a total generating capacity of 405,000 kilowatts in the existing skeleton bays of the Lower Monumental powerhouse.

Proposed Operations: The amount of $330,000 could be used to initiate and complete preconstruction planning.

Justification: Load resource studies prepared by the Bonneville Power Administration demonstrate development of a precarious power shortage in the Pacific Northwest. The growth of power requirements in this region will require development of large thermal power facilities which must be supplemented with additional hydropower capacity if regional power needs are to be met in an economical and efficient manner. Installation of three additional units at Lower Monumental, with a total installed capacity of 405,000 kw, will provide an essential part of the generation capacity required of the Federal system. The benefit-to-cost ratio is 7.6 to 1. Average annual benefits, all power, are estimated at $18,743,000.

Upper Columbia River Navigation Study, Wash.

OPPOSITION

Senator Bible. In testimony before this committee, Mr. Brent Blackwelder, representing the environmental policy center and the Sierra Club opposed the expenditure of any more study funds on the Upper Columbia River navigation study and Ben Franklin Dam. He indicated that at Corps hearings last summer on the Columbia River Basin, citizens turned out in overwhelming numbers to let the Corps know that they did not want any development on this significant 57-mile stretch of the Columbia. Would you comment on these statements?

Colonel Driscoll. Yes, sir. During public meetings last summer on the Columbia River and tributary study a number of people did express opposition to these projects and favored preservation of that portion of the Columbia for recreational and scenic use. But others supported full economic development of the hydroelectric and navigation potential for the benefit of the local area and region. A number of alternatives which fall between those two extremes also were suggested at the public meeting, including use of the river for recreational boating and sightseeing; designation of the reach as a national recreational area; provision of navigation channel to central Washington; development of the hydroelectric potential; and retaining limited public access to preserve the option of a nuclear park complex on the Hanford atomic production reservation.

Senator Bible. What do you expect to recommend regarding navigation on the Columbia River?

Colonel Driscoll. Sir, in view of the varied public interest in the McNary-Wenatchee reach of the Columbia River we propose that further study be accomplished on a system basis, since a decision on this 57-mile segment of the Columbia River will affect the remainder of the Columbia River system development. Accordingly, the Upper Columbia River navigation study has been combined with Columbia River and tributaries system investigation. An active public participation program is a specific part of the study program with community workshops located in Richland and Wenatchee, Wash. The feasibility and desirability of Upper Columbia River navigation is expected to be one of the alternatives investigated.

Relation of Ben Franklin Dam to Navigation Study

Senator Bible. Would you explain how the Ben Franklin Dam is related to the Upper Columbia River navigation study?

Colonel Driscoll. The Ben Franklin project would be a multiple-purpose power development within the reach of the Columbia River being studied under the Upper Columbia River navigation study. Recent developments indicate that further consideration of the Upper Columbia River navigation project, with and without the Ben Franklin Lock and Dam project, should take place in reference to the current regional and national energy crisis which promises to be with us for an indefinite period. In a region which is seriously short of any natural energy resource such as oil, coal, or natural gas, the Ben Franklin Dam would contribute nearly one-million kilowatts of gen-

erating capacity. In generating capacity it would be approximately equal to the output of the existing McNary project downstream.

Senator BIBLE. I can see how the Ben Franklin project would affect the energy crisis but I don't quite see how the Upper Columbia River Navigation study would affect it.

Colonel DRISCOLL. Sir, the Upper Columbia River navigation project would provide a basis for moving bulk cargoes with significant energy conservation over that required by truck or rail transportation. In addition, it could provide a basis for economic development in an area that can readily accommodate this growth thereby relieving the pressure on urban areas.

Senator BIBLE. You mentioned that this reach of the river might be designated as a national recreational area. Will this possibility be made part of any study of Upper Columbia River Navigation?

Colonel DRISCOLL. Yes, sir; this will require study and coordination with Departments of Interior and Agriculture who designated the segment of the Columbia River extending from Priest Rapids Dam to McNary pool, as a potential addition to the national wild and scenic river system. The selection was based on statutory requirements of the Wild and Scenic Rivers Act of 1968 which directs the two secretaries either singly or jointly to identify rivers that have potential for inclusion in the national system.

Senator BIBLE. There certainly appears to be a wide range of alternatives for this reach of river.

Colonel DRISCOLL. Yes, sir. Public views, statutory requirements and technical alternatives affecting overall Columbia River system development are complex and interrelated. We believe that only through further study of the alternatives coupled with an active public participation program, can all the options and their implications be made known to the citizens and to decisionmakers at all levels including the Congress.

BEECH FORK LAKE, W. VA.

Senator BIBLE. The budget request was $3,700,000. The House committee has allowed $3,700,000, and local interests have requested $4,200,000. What is your capability on this project?

General MORRIS. Our capability on this project is $4,200,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $500,000?

General MORRIS. The additional amount would be used to advance recreation by 1 year, and overall project completion by 3 months from December 1976 to September 1976.

ROWLESBURG LAKE, W. VA.

OPPOSITION

Senator BIBLE. Mr. Brent Blackwelder, Washington representative for the Environmental Policy Center, on behalf of the Sierra Club, stated that the Rowlesburg Lake project should be reevaluated in light of the new Water Pollution Control Act Amendments of 1972, and

that they are opposed to dam projects which force upstream residents out of their scenic valleys for the purpose of providing low-flow augmentation for downstream pollution abatement. Further, that downstream pollution problems should be taken care of at the source. What are your views?

Colonel EINEIGL. The Rowlesburg Lake project is currently being restudied to determine the scope of the project and to reevaluate low-flow augmentation needs. This is a cooperative study with other agencies. The Environmental Protection Agency is making a special water quality management study of the Monongahela Basin which will be used in determining the storage needs in Rowlesburg Reservoir. The study assumes adequate at-source waste treatment. The Rowlesburg Lake will alter a relatively small part of the Cheat River and create a new type of environment which will blend with the remaining many miles of natural stream.

Senator BIBLE. When will these studies be completed?

Colonel EINEIGL. The water quality management study by EPA will be completed in the spring of 1974; however, data for reevaluation of Rowlesburg Lake will be available this fall. If EPA finds the storage needs are not greatly modified, then the Rowlesburg restudy could be completed in 1974. However, if storage needs are changed significantly, the restudy of Rowlesburg Lake would continue into the spring of 1976.

LA FARGE LAKE AND CHANNEL IMPROVEMENTS, KICKAPOO RIVER, WIS.

OPPOSITION

Senator BIBLE. Mr. Brent Blackwelder, Environment Policy Center, who also spoke for the Sierra Club, states that this is a marginal project and would flood out a scenic section of the Kickapoo River. Can you comment on these charges?

Colonel EINEIGL. The benefit/cost ratio, based on July 1972 values, is 1.2 to 1. Benefits to be derived from the project include flood damage reduction, fish and wildlife improvement, recreation, and local employment. The Kickapoo River Valley follows a meandering course and is about 106 miles in length. La Farge Lake will inundate 12 miles, or approximately 13 percent of the river. One of the present recreational uses of the Kickapoo River is canoeing from river mile 74 to its mouth. Establishment of La Farge Lake will reduce its use for river canoeing by approximately 16 percent. The loss of scenic river in the La Farge area will be offset by the establishment of a spectacular inland lake which will provide many recreational facilities in an area that does not contain many natural lakes, and will permit water access to many scenic river areas not presently accessible. The frequent floods on the Kickapoo River have deteriorated the quality of life in the valley and unless controlled will ultimately cause the abandonment of all or much of the several villages located along the river. All possible alternatives have been reviewed, and the reservoir, together with supplemental protection works at Soldiers Grove and Gays Mills, offers the only practical solution to the area problems.

Senator BIBLE. There is nothing in the budget, and there has been a request for $1,540,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $50,000 to initiate preconstruction planning.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Northport Harbor, Wisconsin

Summarized Financial Data:

Estimated Federal Cost (Corps of Engineers)		$ 1,950,000
Estimated Federal Cost (U. S. Coast Guard)		16,000
Estimated non-Federal Cost		300,000
Cash Contribution	$ 300,000	
Other	0	
Total Estimated Project Cost		2,266,000
Allocations to Date		0
Balance to Complete		1,950,000
Amount that could be utilized in FY 1974		50,000

Authorization: Section 201 of 1965 Flood Control Act (Authorized 1972)

Location and Description: Northport is located at the northern tip of Door County, Wisconsin, which is on a peninsula in the east-central part of the State. The project provides for construction of breakwaters having a total length of about 1,670 feet, an entrance channel and a maneuver area within the breakwaters and a parking area, sanitary facilities and safety railings to accomodate sport fishing from the breakwaters.

Proposed Operations: The amount of $50,000 could be used to initiate preconstruction planning.

Justification: The proposed improvement will benefit commercial ferry navigation and recreational boating. The improvement will promote safe, dependable ferry transportation between the mainland and Washington Island, north of the proposed harbor. It will also provide emergency refuge to recreational craft navigating the Porte des Morts Passage. Additional benefits will accrue to sport fishing enthusiasts who will be able to fish from the breakwaters. The proposed improvement is expected to increase tourism in the area. This will provide Regional Development Benefits. The benefit-to-cost ratio is 1.6 to 1. The average annual benefits are as follows:

Navigation	$ 188,300
Fish and Wildlife	48,800
Total	237,100

State Road and Ebner Coulees, Wis.

Senator Bible. There is nothing in the budget. Local interests have requested $60,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $60,000 to initiate preconstruction planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: State Road and Ebner Coulees, Wisconsin

Summarized Financial Data:

Estimated Federal Cost		$ 11,900,000
Estimated non-Federal Cost		890,000
Cash Contribution	0	
Other	$ 890,000	
Total Estimated Project Cost		12,790,000
Allocations to Date		0
Balance to Complete		11,900,000
Amount that could be utilized in FY 1974		60,000

Authorization: 1968 Flood Control Act

Location and Description: State Road and Ebner Coulees, tributaries of the Mississippi, are located in La Crosse County in west-central Wisconsin on the east side of the city of La Crosse. The plan of improvement for State Road Coulee consists of channel deepening and enlarging downstream from Hagen Bridge to the mouth, and includes an 11,600-foot section of concrete-lined, trapezoidal shaped channel, a 600-foot long concrete flume, a drop structure, a stilling basin, five new street bridges and alteration of a railroad bridge. The plan of improvement for Ebner Coulee provides for diversion works about 8,600 feet long, controlling flood flows through a concrete flume, and twin precast-concrete conduits into an enlarged Miller Coulee channel and thence into a marshy area in the La Crosse River flood plain.

Proposed Operations: The $60,000 would be used to initiate preconstruction planning.

Justification: State Road and Ebner Coulees drain contiguous areas of about 1 and 6 square miles, respectively. Although the coulees drain relatively small areas, the drainage areas are extremely steep and rocky, resulting in very rapid runoff. Inadequate channel capacities in the lower reaches contribute to the flood problem. As a result, the wide valley floor is inundated. In addition, the storm sewer, which serves as an outlet for Ebner Coulee, is capable of carrying only a small portion of the runoff. Flood flows in excess of the storm sewer capacity move overland and empty into the lower reach of State Road Coulee. Overland flood depths could reach 5 feet. Because of extensive urban development in the flood plains, runoff can now cause major damages to residences, business establishments, roads and bridges. The coulee flood plains provide the only available area for residential expansion based on the topography of the area. Flood damage potential is becoming progressively more serious as this rapid residential development continues. Flood damages occurred in August 1959 from State Road Coulee overflows and on several occasions since 1955 from Ebner Coulee overflows. Average annual damages to residential, commercial and public properties are estimated at $852,000. Flood damages to residential property comprises the greater part of total damage. Remaining damages occur to commercial and public property. The proposed plan would provide generally full protection to this urban area against runoff from all floods up to about a 50-year frequency of recurrence. The benefit-to-cost ratio is 1.3 to 1. The average annual benefits, all flood control, are $719,000.

Federal Dredging Program

OPPOSITION

Senator Bible. The National Association of River and Harbor Contractors has indicated opposition to the modification of the electrical system of the *Comber* class dredges and suggested that it violates the committee directive restricting the Corps, for the time being, from going forward with plans for replacement or modification of Corps dredges. Briefly present the reasons for requesting approval to proceed with this modification in fiscal year 1974.

Mr. Blankinship. Let us say at the outset, Mr. Chairman, that the work involved, in our view, is in the nature of repair work, rather than a modification which would violate the directive referred to. Please let me explain the nature of the work involved. The major electrical equipment on the *Comber* class dredges is 36 years old. The insulation on this machinery has deteriorated to the extent that it is checking and flaking off the coils. In addition, the commutators have been machined down nearly to their physical limits. As a result, many of the shunt field coils cannot pass comparative resistance or insulation checks, which indicates a serious safety hazard to the vessel and its crew. The existing machinery is of the direct current (d.c.) type which was in routine use in the marine field at the time the *Comber* class dredges were constructed in 1947. However, the use of large-scale d.c. electrical equipment in the marine field has been supplanted by alternating current (a.c.) equipment in recent years. As a result, it is inordinately difficult and expensive to obtain replacement and repair parts for what has become obsolete electrical machinery. For example, the lead time for the procurement of replacement parts varies from 9 to 18 months.

We are faced with the urgent need to either replace the existing equipment with new d.c. machinery, which is not feasible since U.S. manufacturers no longer produce this type of equipment or repair parts in any volume or to replace the obsolete machinery with modern, commercially available, a.c. components. Thus, we consider this work to be essentially repair work rather than a modification which would violate the committee's directive.

DECREASE IN ANNUAL MAINTENANCE COSTS

Replacement of the existing equipment will result in a substantial decrease in annual maintenance costs; eliminate the serious hazardous condition which exists due to the extensive deterioration of the insulation of the existing machinery; and will assure the continued operation of the *Comber* class dredges which are essential to maintain the authorized project depths in the offshore entrance channels of the major ports of the United States.

Senator Bible. Does the dredging industry have dredges similar to the *Comber* class dredges?

Mr. Blankinship. No sir. The only seagoing hopper dredges in the United States, capable of functioning efficiently for extended periods in exposed and ocean waters, are operated by the Corps of Engineers.

Senator Bible. It has been repeatedly stated that the dredging industry, when given the opportunity to bid on dredging jobs, can ac-

complish the work at considerable savings over the Corps doing the work with Government plant. What has been the Corps experience in this matter?

Mr. BLANKINSHIP. Mr. Chairman, as has been stated in previous testimony, there have been instances where private dredging companies have submitted bids below the Corps estimates of accomplishing the work with Government plant. However, there has similarly been cases where the work has been accomplished by Government plant at a cost considerably below the lowest bid submitted by the industry. For example:

In fiscal year 1970 the low bid for removal of about 200,000 cubic yards of material in Calumet Harbor was $650,000. The Government estimate for the work was $470,000. The job performed by Government plant removed 182,539 cubic yards at an actual cost of $454,700. Adjusting the contractor's bid to actual yardage removed would have resulted in a cost of $634,600. In this case accomplishment of the work by Government plant resulted in a savings of about $179,900.

In fiscal year 1972 a similar comparison for work at Indiana Harbor showed a savings of almost $190,000 by accomplishing the work by Government plant.

It is interesting to note the recent experiences in Buffalo Harbor. In fiscal year 1971 the low bid received for work in this project was $752,000 as against a Government estimate (based on fair and reasonable cost) of $645,000. In fiscal year 1972 comparable work in this project was advertised. The Government estimate was based on use of the hopper dredge Hoffman. The low bid submitted was $396,500 as against the Government estimate of $224,855. Actual cost with pertinent adjustments showed a savings of about $335,000 through use of Government plant.

Other cases can be documented. It may also be stated that in some instances where work was advertised no bids were received from the industry.

Where possible the present practice of advertising will be continued.

DREDGED MATERIAL RESEARCH PROGRAM

Senator BIBLE. Mr. John A. Downs, president of the National Association of River and Harbor Contractors, stated his opinion that the corps nationwide dredged material research program authorized by Public Law 96–611 should be limited in scope to just that authorized. Do you consider that the authorized scope of the investigation has been exceeded?

Mr. BLANKINSHIP. No, sir. The Corps feels, Mr. Chairman, that the scope of its research program is completely compatible with the authorizing legislation. The authorizing legislation provides that the study "shall include, but not be limited to, investigation on the characteristics of dredge spoil and alternative methods of its disposal."

The Corps believes that the impetus for authorizing the research program was concern over unknown aspects of the environmental effects of the disposal of dredged material. Legislation addressed to the problem of water quality as affected by dredging and disposal in the Great Lakes indicates that land disposal was considered to be as much within the scope of the proposed research as open water disposal.

If concern over the environmental consequences of dredged material disposal was indeed responsible for the research program authorization, then the program's scope by necessity must be broad. Water quality changes often are indicative of potential environmental effect and hence study of water quality alone will not suffice.

SCOPE OF RESEARCH PROGRAM

Senator BIBLE. How did the Corps actually go about determining the specific scope of the research program?

Mr. BLANKINSHIP. The scope of the program was the result of an intensive, nearly year-long evaluation of the Corps nationwide dredged material disposal problem. The results of this evaluation is presented in the Waterways Experiment Station Technical Report H–72–8, entitled, "Disposal of Dredge Spoil, Problem Identification and Assessment and Research Program Development," dated November 1972.

It was accomplished by an interdisciplinary team of scientists and engineers who made extensive contact with nearly all relevant Corps offices, other Federal agencies, universities, research institutes, and private firms, including representatives of the dredging industry. The survey also included a comprehensive literature evaluation and analysis of all completed and current relevant research. Fully 90 percent of the report on this survey is a discussion of the rationale of and justification for the scope of the research program.

The Corps would like to point out that the technical report was subjected to an extraordinary amount of review and evaluation by the Corps itself, six Federal agencies, including the Environmental Protection Agency and the Council on Environmental Quality, a special Smithsonian Institution advisory committee, and numerous other groups and individuals. All of the reviewers favorably endorsed the need for the program and one concluded that its scope was excessive. All correspondence relating to these reviews was submitted to and considered by the Office of Management and Budget.

Senator BIBLE. Previous opposition testimony contends that the research program is unnecessary in light of passage of legislation regulating the discharge of dredged materials into the oceans and into the Nation's navigable waters. Specific reference is made to Public Law 92–532 and 92–500 passed in 1972. How do you consider this legislation affects the need for Corps research program?

Mr. BLANKINSHIP. Both of the acts mentioned call for the Environmental Protection Agency (EPA), in conjunction with the Corps where dredging and dredged material disposal is concerned, to promulgate guidelines or criteria for evaluating the potential for degradation of the water bodies concerned. Criteria development for the first act to be considered, Public Law 92–532, has been pursued in such a manner as to consider input from interested parties and to reflect as far as practical the current state of scientific knowledge. Both Corps and EPA personnel involved in the criteria development can testify that the current state of knowledge has been shown to be wholly inadequate to develop completely meaningful criteria. Consequently, test procedures and values associated with the criteria have been set forth in the published version, Federal Register, vol. 39, No. 94, part II, May 16, 1973, with the specific statement that they are "subject to

revision and modification based on the general increase of knowledge or specific information on the effects of the disposal of dredged materials in the ocean."

Changes in these criteria can have the effect of changing the mode of disposal of millions of cubic yards of dredged material with resultant major changes in cost. Consequently, there is a definite relationship between the research program and the legislation that has been passed. This relationship is so close, in fact, that certain work units under the research program are addressing themselves directly to providing a firmer scientific base on which to develop criteria for both pieces of legislation. Additional work units will be initiated, possibly as cooperative efforts with the EPA, which relate to the mechanics of more standardized sampling and testing procedures associated with the criteria.

In summary, therefore, the Corps can only conclude that the legislation has shown a more definite need for the research rather than reducing that need.

STUDY BUDGET EXCESSIVE

Senator BIBLE. It has been stated that a study budgeted to cost $30 million is patently excessive and that the Corps has already made numerous studies in this area. How was the cost of $30 million derived and does the program relate to previous studies?

Mr. BLANKINSHIP. Mr. Chairman, the relationship of this research program to previous studies is easy to explain and this relationship itself points out dramatically that the cost is definitely not excessive and, in fact, quite realistic. Several points need to be made in this regard.

First, it is relevant to mention that the figure of $30 million is an estimate of probable cost of a 5-year program based on best available information on and experience with the cost of this type of research. It presumes that a portion of the research will be in the form of cooperative efforts with other agencies and that the entire program will be accomplished as proposed. This may or may not be the case as will be pointed out shortly.

Second, it must be clarified that the full $30 million has not actually been budgeted. In authorizing the conduct of the research program, the OMB advised that commitment to the recommended full 5-year and $30 million effort is contingent on production of results which justify continuation. The program will be reviewed on an annual basis to establish funding levels, scope, and direction, and need for continuation.

Third, the research program is substantially different in scope and intent from any on-going research being conducted either by the Corps or others. All other Corps-sponsored research is directly related to a particular project or a particular geographic area and is intended to fulfill a short-term need. None is principally concerned with obtaining answers to basic cause-effect relationships or identifying disposal practices or alternatives that can be applied over a wide area. Information useful to the nationwide comprehensive effort will undoubtedly result from these short-term efforts, but not as their principal objectives.

EFFECT ON WATER QUALITY IN HARBOR DREDGING

A previous Corps study was accomplished between 1967 and 1969, in association with the Federal Water Pollution Control Administration and other agencies, to consider the effects on water quality of harbor dredging operations in the Great Lakes. Although definitive information resulted in certain areas and some questions were answered, the basic one of the effects of dredge dumping on open-lake disposal areas remained open to question. It is highly significant that this only partially successful 2-year study of one geographic region cost approximately $8 million. In this context, completion of the more comprehensive study is not unreasonably estimated at $30 million. We feel that, if nothing else, the Great Lakes study well illustrates the inherently significant cost of environmentally related research, particularly that involving marine areas.

Senator BIBLE. It has been suggested that the scope and consequently the cost of the program could be reduced by eliminating certain particular research areas and tasks, such as those concerned with the fate of dredged materials, the more efficient operation of confined disposal areas, new disposal concepts, productive uses of spoil, and spoil treatment. Do you consider this reduction in scope to be reasonable or advisable, or a realistic way to reduce the cost of the program?

Mr. BLANKINSHIP. No sir, first, Mr. Chairman, it should be pointed out that the research areas and tasks are not independent entities that can be arbitrarily expanded or reduced in number to an ideal-sized program. Many of the tasks bear a dependent relationship to one another in one or more ways and each contributes toward the success of the whole. Others are designed to explore multiple disposal alternatives that may be applicable under different conditions. Subdivision of the program into areas and tasks is a necessity of successful management and does not reflect their technical or topical relationships.

FOSTERING ON UNNECESSARY EXPENDITURE OF FUNDS

Second, the Corps is of the opinion that a reduction in the scope of the program would foster rather than deter an unnecessary expenditure of funds. Portions of the program are intentionally designed to be broad and exploratory since viable disposal alternatives cannot now be identified with certainty and cannot be predicted. Alternatives for disposal must be several in number and variable in character because of the tremendous variation in the types of material dredged and the extreme variability in the physical and cultural environment in which disposal must take place.

The Corps feels it must initially consider as many possible and promising alternatives as it can so that it can eventually restrict its effort to the more completely satisfactory ones. A concept of constant and dynamic program planning has been implemented to insure that the program scope remains sufficiently flexible to focus on profitable

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endeavors and to delete unprofitable ones. The research program has built-in safeguards including high-level technical review and OMB review of the adequacy of the production of results, to insure the prompt termination of funding for any indicated unprofitable avenues of endeavor. But until and if possible alternatives are shown not to be environmentally compatible, technically satisfactory, and economically feasible, the Corps cannot afford not to include them in the scope of the program. To understand this philosophy, one need only consider that a single major confined disposal area, one of the current disposal alternatives available, may cost several million dollars to construct and may have a life expectancy according to today's knowledge of area operation of not over 10 years.

To summarize the Corps position, it feels it has a rare opportunity to plan and conduct an orderly, efficient, and scientifically valid research program aimed at a definable and completely justifiable problem of national concern. To fragment the research for an arbitrary reason could only result in an increase rather than decrease in total program time and cost. The Corps fully expects that savings resulting from application of results of the research will exceed by several times the total 5-year cost of the program.

NATIONAL DREDGING STUDY

Senator BIBLE. It has been suggested that future work on the Corps dredged material research program beyond that already approved be deferred pending the results of the national dredging study. Are these two studies interrelated?

Mr. BLANKINSHIP. Not directly, the directives of the House and Senate subcommittees in their reports on the national dredging study legislation are felt to be essentially requests to review in depth the entire area of dredging policies and practices of the Corps to determine which alternatives would provide for dredging in the most efficient, economical, timely manner giving consideration to those factors which directly affect bidding processes. This study is related primarily to the policy and contractual relationships involved with the dredging program. It will not involve study of the actual dredging and disposal problems.

The dredge material research program and the national dredging study cover different aspects of the Corps dredging program.

Senator BIBLE. How does the estimated total cost of $30 million for research compare with the total amount of money spent for dredging and dredged material disposal and what is the magnitude of the cost savings that is likely to result from the research?

Mr. BLANKINSHIP. Mr. Chairman, the fiscal year 1974 budget calls for an expenditure of $172 million for maintenance and new work dredging. Projecting this expenditure to a 5-year period and with no allowance for normal price level increases, the amount proposed for research approximates only 3.5 percent of the total. In reality, the percentage will likely be well below 3 percent.

COST INCREASE GREATER WITHOUT BENEFIT OF RESEARCH

In response to the second part of the question, there can surely be little doubt in anyone's mind that to implement those procedures necessary to afford even a minimal level of environmental protection much less environmental enhancement will result in a dramatic increase in dredging and disposal costs. The Corps is convinced that the cost increase without the benefit of the research will be substantially greater and may well be prohibitive for many projects.

The National Environmental Policy Act was a mandate for the Corps and other agencies to conduct their operations in the most environmentally compatible manner. For the Corps, this means, among other things, that the most acceptable dredged material disposal sites and/or methods must be employed. To date, an unfortunately large number of decisions of this type have been based more on emotional factors than on technical ones. All too often the decisions are based more on a fear of unknown consequences than on actual knowledge of the relative effects or consequences of the various alternatives. Major changes in disposal practices, such as from open water disposal to confined land disposal, have increased dredging costs by as much as ten times. It is possible that the research program in question could eventually save the Government as much money in 1 year as the total 5-year program may cost.

Mississippi River and Tributaries

OPPOSITION

Senator Bible. Mr. Brent Blackwelder, representing the Environmental Policy Center and Sierra Club, testifying before this subcommittee offered comments on the recent Mississippi River flood and asked why after the expenditure of more than $1.7 billion on flood control for the Mississippi, we still have such staggering flood losses.

Would you address this comment?

Colonel Edgar. The $1.7 billion expenditure represents only about 45 percent of the authorized flood control measures for the Mississippi River and Tributaries project. While we experienced about $284 million flood damages below Cairo, Ill., the existing completed works of the MRT project alone prevented about $6.1 billion of damages during the 1973 flood. While the authorized flood control measures do not provide complete flood protection for the lower Mississippi Valley, completion of remaining works would have prevented an additional $100 million damages in 1973.

Senator Bible. Mr. Blackwelder also stated: The flow at St. Louis is only two-thirds the flow of record, yet flood crests are at an all time high. Would you indicate for the committee what your observations of the flood are in this regard?

Colonel Edgar. It is true that flood crests in the St. Louis area were at an all time high; however, this was a result of the confining effect of the levees. This confining effect was taken into consideration in designing the levees to contain the flood of record.

Senator BIBLE. The Environmental Policy Center has stated that they support increased funding for the Water Resources Council and would like to request that the WRC be funded to do a special study of the Mississippi River flood situation. What are your views of the need for a special study by the WRC?

Colonel EDGAR. Sir, we are presently completing a study which has been fully funded, the lower Mississippi region comprehensive study. This study under the general direction of the Water Resources Council will address the Mississippi River flood situation in broad terms. More detailed studies will also be necessary, and we believe the Corps of Engineers is the agency most qualified to conduct them.

Senator BIBLE. In testimony before this subcommittee, Mr. Brent Blackwelder made the following statement concerning Mississippi River floods and Federal flood control policy:

> The 1966 Task Force on Federal Flood Control Policy noted in its report "A Unified National Program for Managing Flood Losses" (House Document 89–465) that over $7 billion has been spent by the Corps and the SCS on flood control, yet damages continue to show an upward trend and now exceed a billion dollars annually. Furthermore, despite the roughly $500 million we spend each year on flood control, flood damages are projected to jump to $5 billion in 2020 A.D. The fact that we are playing a losing game is indicated by the alarming statistic that every $6 dollars of potential flood damage we prevent is offset by $5 of actual damages to new structures that are erected on "protected" flood plains.
>
> The Corps of Engineers recently gave a briefing to both House and Senate Public Works Committees on the flood situation along the Mississippi River. The Corps argues that it has spent over $1.7 billion on flood control measures on the Mississippi and in this year alone has prevented over $6 billion on flood damages. The Corps thus proclaims to the Congress that its flood control measures have more than paid for themselves in one year. Unfortunately flood damages along the Mississippi already exceed a shocking $200 million, and the question must be raised as to why after so much Federal investment do we have such enormous losses. We call attention to the fact that the flow of the river at St. Louis was only 2/3 the flow of record, yet flood crests were at an all time high. Why has so much damage occurred? Channel encroachment? Why was this not prevented? Why did not the Corps in building reservoirs and levees require as part of local cooperation that no development take place in the flood plain? In 1937, the National Guard had to be called out to allow the Corps to use a relief floodway near the confluence of the Ohio and Mississippi Rivers because squatters had settled in the floodway. Why was this floodway not utilized this year?

Would you address yourself to this testimony?

Colonel EDGAR. The $7 billion expenditure for flood control, quoted in House Document 89–465, was for the entire United States for the period 1936–66, and was not limited to the Mississippi River system.

We do not consider that we are playing a losing game in flood control, but we consider that the results in 1973 for the Mississippi River system alone is evidence that the battle is being won.

LOWER MISSISSIPPI VALLEY FLOOD DAMAGE

In 1973, actual flood damages in the Lower Mississippi Valley actually exceeded the amount of $200 million, stated by Mr. Blackwelder. Damages amounted to about $420 million. In absolute terms, this is a substantial sum; however, relative to the magnitude of the flood and the damages that would have occurred without flood protection, damages sustained are not nearly so "shocking." Damages in the absence of flood protection would have been in excess

of $7.6 billion. That is to say that flood control works prevented $7.2 billion in damages, or all but about 5 percent of the potential damages.

The inference in Mr. Blackwelder's statement appears to be that damages sustained are much too large in spite of large Federal investment. It should be remembered that a large amount of development occurs in the flood plain even where a flood threat is recognized. For example, of the total damages sustained, $235.6 million was to agricultural enterprises. This damage occurred on 7 million acres of cropland, much of which would be farmed even without flood protection. For the most part, damages were sustained by farmers in pursuit of economic gain with knowledge of the flood threat. Such damages are reducible only by additional flood protection investment or evacuation of the activity from the flood plain. Evacuation could not be accomplished under existing authority and even with such authority at an unacceptable economic and social cost. Further, it should be recognized that much of the urban development damaged in the 1973 flood was outside the area protected by Federal works. In these areas, the Corps had no means of reducing damages except by providing emergency flood fighting assistance, which was done to the maximum extent possible.

Total damages sustained could have been reduced by $130 million if authorized projects not yet completed were in operation.

FLOOD OF RECORD

The flood of record on the Mississippi River at St. Louis, with a discharge of 1,300,000 cubic feet per second, occurred on June 27, 1844, prior to construction of any flood control improvements. Construction of levees and floodwalls to protect property in the flood plain has restricted flow capability, thus resulting in higher stages. While there was approximately $136 million in damages in the Mississippi Valley from the vicinity of Hannibal, Mo., to Cairo, Ill., completed projects prevented an additional $1.1 billion in damage. Completed flood control works in this area afforded essentially complete protection against Mississippi River flooding. The damage actually incurred was primarily in areas not protected by flood control projects, with some damage in protected areas due primarily to interior runoff.

Development of the flood plains of the Mississippi River was done by local people with little or no land-use controls by local or State governments. In the past, it was not a policy of the Federal Government to rely on land-use regulations when constructing a Federal project, since this is an exclusive responsibility for State and local entities. In recent years, however, we have given greater attention to the role of local land-use controls in conjunction with our projects.

As a result of Executive Order 11296, issued in August 1966, various Federal agencies of the Water Resource Council developed flood hazard evaluation guidelines for Federal executive agencies and issued them in May 1972. These guidelines are intended to promote the policy of the Executive order to preclude uneconomic, unnecessary, and hazardous use of the flood plains. Our planning guidance is in this spirit. Mr. Blackwelder asked why the Birds Point-New Madrid Floodway was not utilized this year. The criteria for operat-

ing the floodway is that operation would begin when the Mississippi River stage was 58 feet on the Cairo gage and predicted to exceed 60 feet. This year the crest on the Cairo gage was 55.7 feet.

FLOOD CONTROL STRUCTURES PROVING LESS THAN ADEQUATE

Senator BIBLE. In testimony before this committee on May 14, 1973, Mr. Joel M. Pickelner, on behalf of the National Wildlife Federation stated that the billions of dollars spent in this country on flood control structures are proving themselves to be less than adequate.

Colonel EDGAR. To the contrary, Mr. Chairman, flood control works constructed by the Corps of Engineers have proven more than adequate. Flood control structures in the United States save millions of dollars in damages prevented each year. In the Lower Mississippi River Valley alone 7.2 billion dollars in damages were prevented during the 1973 flood by the existing flood control projects. An even greater amount would have been saved had this project been complete.

The cost of this project through fiscal year 1972 is $1,742,096,000. Comparing this amount to the damages prevented in the 1973 flood shows that spending money on flood control is a prudent investment and that the completed structures have proven very adequate.

Senator BIBLE. Mr. Pickelner also stated:

> One basic problem which should be examined simply is the lack of coordination and cooperation between the various State and Federal Agencies currently dealing with the problem. This lack of coordination is at the root of the problems which we are now experiencing on the Mississippi River System.

Is there a lack of coordination and cooperation between the States and Corps?

Colonel EDGAR. No, sir. The Corps of Engineers continually makes every effort to coordinate and cooperate fully with the interested States and all other Federal agencies. This coordination is continuous in all phases of project development from preauthorization planning through project completion.

RETENTION OF RUNOFF IN WATERSHED AREAS

Senator BIBLE. The National Wildlife Federation also charged in its testimony that flood damages that occurred during the flood this spring along the Mississippi River system could have been less had it not been for the Soil Conservation Service and Corps' programs of channelization and drainage of wetwands which allowed stripping of thousands of acres of additional land of its vegetation and its resulting quicker runoffs putting too much water into the mainstream at one time. How much would the damage have been reduced if some of the runoff were retained in the watershed areas for a while?

Colonel EDGAR. Because of above normal rainfall over an extended period, the ground became saturated throughout most of the Mississippi River drainage area and ensuing rainfall resulted in high runoff. Any additional retention that could have been effected had the lands mentioned not been cleared would have had minimal effect on flood flow in the Mississippi River. As the 1973 flood developed over an extended period, reduction of damages by retention of runoff in the watershed areas would not be significant.

Senator BIBLE. The National Wildlife Federation stated that during the recent Mississippi flooding, the Corps delayed using the Atchafalaya Floodway until the last minute because of the potential damage it could have caused to commercial interests in the floodway. They indicated that more than 4,000 people are living on the flood plain with new structures going up daily.

Did you delay the use of the floodway for this reason? Are new structures going up daily? Is 4,000 the correct number of people living in the floodway?

Colonel EDGAR. Yes, sir, we always delay using all floodways as long as possible to prevent damages. The present flood control plan for the lower Mississippi Valley provides for the West Atchafalaya Floodway to be the last flood control feature to be used in the event of a flood. The Morganza Floodway was initially placed in operation to provide relief of a tense situation at Old River Low Sill Structure and to provide relief to the main line Mississippi River levees below Morganza. Operation of Morganza increased the flows in the Atchafalaya Floodway approximately only 15 percent. The Atchafalaya Floodway would have been flooded regardless of the operation of the Morganza Floodway by the Corps.

RESIDENTS IN ATCHAFALAYA FLOODWAY

The 1972 census indicated the following number of people residing in the overall Atchafalaya Floodway:

Atchafalaya Basin Floodway	547
Morganza Floodway	0
West Atchafalaya Floodway	3,524
Total	4,071

Approximately 87 percent of the number of people indicated reside in the West Atchafalaya Floodway.

Only the downstream portion of the West Atchafalaya Floodway was flooded in the 1973 flood. This flooding was due to backwater primarily from the Atchafalaya River. A total of about 847 people were affected by the flood, 547 in the Atchafalaya Basin Floodway and 300 in the West Atchafalaya Floodway.

It is quite likely that new structures are being built as there is no restriction on construction in the floodway with the exception of Morganza. The Corps has easements in the Morganza Floodway which do not allow construction without a permit. Construction of residences are not allowed.

Senator BIBLE. The National Wildlife Federation recommended that the Congress require the agencies to report on the status of mitigation on each project—both authorization and funding.

What does the Corps do now in this regard?

Colonel EDGAR. Sir, any proposed mitigation measures which exceed the authority of the Chief of Engineers are reported to Congress for authorization.

Also, the Corps annually reports to the Congress by means of testimony and data submitted in support of the budget recommendations, the status of mitigation measures on ongoing projects. In addition, the public and other interested agencies are kept informed by means of public meetings and through normal coordination.

FLOOD CONTROL, MISSISSIPPI RIVER AND TRIBUTARIES,
GENERAL INVESTIGATIONS

Senator BIBLE. For examinations and surveys the budget estimate is $1,062,000. The House committee has allowed $1,362,000, and local interests have requested $2,453,000. What is your capability for surveys in the Mississippi River and tributaries project?

General MORRIS. Mr. Chairman, our capability for surveys is $2,415,000.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Flood Control, Mississippi River and Tributaries, General Investigations

The FY 1974 budget contains $1,062,000 for surveys of which:

$75,000 will be used to continue the Bayou du Chien, Kentucky study;
$140,000 will be used to continue the Bayou Rapides, Boeuf and Cocodrie and Outlets, Louisiana study;
$33,000 will be used to complete the Catahoula-Charenton Area, Louisiana study;
$80,000 will be used to continue the Lake Providence, Louisiana study;
$100,000 will be used to continue the Mississippi River, Memphis, Tennessee study;
$54,000 will be used to continue the Obion and Forked Deer Rivers and Tributaries, Kentucky and Tennessee study;
$317,000 will be used to continue the Atchafalaya Basin (Water and Land Resources), Louisiana study;
$60,000 will be used to continue the St. Francis River Basin below Wappapello, Arkansas and Missouri study;
$8,000 will be used to complete the St. Johns Bayou and New Madrid Floodway, Missouri study;
$120,000 will be used to continue the Vicksburg Harbor, Mississippi study;
$75,000 will be used to continue the Wolf-Loosahatchie Rivers and Nonconnah Creek, Tennessee and Mississippi study.

Additional amounts could be used for budgeted surveys in Fiscal Year 1974 as follows:

$20,000 would be used to advance the Bayou du Chien, Kentucky study;
$40,000 would be used to advance the Lake Providence, Louisiana study;
$50,000 would be used to advance the Mississippi River, Memphis, Tennessee study;
$883,000 would be used to advance the Atchafalaya Basin (Water and Land Resources), Louisiana study;
$60,000 would be used to advance the Vicksburg Harbor, Mississippi study;

In addition for unbudgeted surveys the following amounts could be used in FY 1974:

$10,000 could be used to initiate the Berwick Lock-Atchafalaya River Basin, Louisiana study;
$15,000 could be used to initiate the East Bank Levees, Mississippi River, Louisiana study;
$20,000 could be used to initiate the St. Francis River, Missouri and Arkansas (Fish and Wildlife);
$20,000 could be used to initiate the Walnut-Roundaway Bayou, Louisiana study;
$15,000 could be used to initiate the Mississippi River, Phillips County study;
$100,000 could be used to initiate the Mississippi River, Cairo, Illinois to Baton Rouge, Louisiana study;
$20,000 could be used to initiate the Larto Lake-Saline Lake Area, Louisiana study; and
$100,000 could be used to initiate the Yazoo Basin, Review of Reports subject to authorization.

Mississippi River Levees

Senator Bible. The budget request was $5,800,000. The House committee has allowed $11,569,000, and local interests have requested $46,630,000. What is your capability on this project?

General Morris. Our capability on this project is $46,630,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $40,830,000?

General Morris. The additional amount would be used to raise levees in critical areas and to advance construction of utility alterations, levee enlargement and gravel roads at various locations.

CHANNEL IMPROVEMENT

Senator Bible. The budget request was $36 million. The House committee has allowed $40,500,000, and local interests have requested $53,600,000. What is your capability on this project?

General Morris. Our capability on this project is $53,600,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $17,600,000?

General Morris. The additional amount would be used to advance construction of revetment, dike and dredging work in certain areas.

Mud Lake Pumping Plant, Tenn.

Senator Bible. There is nothing in the budget, and local interests have requested $30,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $30,000 to initiate preconstruction planning.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Mud Lake Pumping Plant, Tennessee

Summarized Financial Data:

Estimated Federal Cost		$850,000
Estimated Non-Federal Cost		20,000
Cash Contribution	$ 0	
Other	20,000	
Total Estimated Project Cost		$870,000
Allocations to Date		0
Balance to Complete		850,000
Amount that could be utilized in FY 1974		30,000

Authorization: Section 201 of the 1965 Flood Control Act (Authorized 1970).

Location and Description: The project is located southwest of Ridgely in Lake County, Tennessee. Mud Lake has a drainage area of 8-1/2 square miles and is located within the authorized Harris Ditch drainage area. When river stages permit, Mud Lake drains through the existing Mud Lake culverts under the Mississippi River levee. The project provides for construction of a new inlet channel from a point 2,000 feet upstream from the existing Mud Lake culverts northward to the Mississippi River levee; a 150-cfs pumping station, without a gravity outlet; and an outlet channel to carry the pumping station discharge to the Mississippi River.

Proposed Operations: The amount of $30,000 would be used to initiate preconstruction planning.

Justification: The area, a highly developed agricultural area, suffers from damaging floods, with durations from 3 to 15 days annually. The flood of June 1970 caused damages estimated at $50,000. A recurrence of the flood of record, the 1927 flood, would cause a loss of $100,500. The project will provide channels which will contain a 10-year frequency flood and will lower stages resulting from greater floods. Estimated average annual damages without the project are $24,000. With the project, residual average annual damages would be $600. The benefit-to-cost ratio is 1.08 to 1. The estimated average annual benefits are broken down as follows:

Flood Control	$49,500
Area Redevelopment	7,300
Total	$56,800

Old River

Senator Bible. The budget request was $250,000. The House committee has allowed $500,000, and local interests have requested $1,950,000. What is your capability on this project?

General Morris. Our capability on this project is $1,950,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $1,700,000?

General Morris. The additional amount would be used to advance construction of revetment at Long Lake and Turnbull Island.

St. Francis Basin

Senator Bible. The budget request was $12,500,000. The House committee has allowed $14 million, and local interests have requested $15,500,000. What is your capability on this project?

General Morris. Our capability on this project is $15,500,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $3 million.

General Morris. The additional amount would be used to advance relocations and construction of channels, levees, and recreation facilities.

Reelfoot Lake—Lake No. 9, Tenn. and Ky.

Senator Bible. The budget request was $50,000. The House committee has allowed $100,000 and local interests have requested $250,000. What is your capability on this project.

General Morris. Our capability on this project is $250,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $200,000.

General Morris. The additional amount would be used to complete planning and initiate construction.

Cache Basin, Ark.

BUDGET REQUEST, CAPABILITY, CONSTRUCTION DELAY

Senator Bible. The budget request was $1,700,000. The House committee has allowed $700,000 and local interests have requested $1,800,000. What is your capability on this project?

General Morris. Our capability on this project is now $1,200,000, Mr. Chairman, of which $1 million is subject to authorization.

Senator Bible. What caused the reduction?

General Morris. The delay in construction due to litigation of the revised request of $1,200,000, there would be $200,000 to continue planning and environmental studies.

OPPOSITION

Senator Bible. Mr. Brent Blackwelder, representing the Environmental Policy Center and the Sierra Club, testified regarding the Cache Basin project. This was one of 13 projects that he urged this

committee not to fund. He opposed funding for these projects because they believed them to be inconsistent with recommendations of the National Water Commission's Draft Report. Would you please comment on this statement?

Colonel EDGAR. The allegation concerning project inconsistency with findings of the National Water Commission Draft Report is quite general, and does not state the specific grounds upon which the claim is based. No specific reference is made to any particular recommendation or finding of a voluminous study report which is, in any event now still in a draft stage. Under the circumstances, it is not possible to determine from Mr. Blackwelder's statement what specific portions of the report may be relevant to the matter. There is no current requirement for the Corps' projects to be consistent with the Commission's tentative findings and it would be coincidental if they were.

PROJECT ALTERNATIVES

Senator BIBLE. Mr. Blackwelder also stated that there is a sound sensible alternative for this project which would cost less money and which would protect precious natural resources. Have you considered such an alternative?

Colonel EDGAR. There have been many alternatives considered throughout the planning process which has resulted in the presently proposed plan of problem solution. We do not know which alternative Mr. Blackwelder has reference to; however, studies of the Cache Basin flood problem extend all the way back to the late thirties. There were three separate reports on the matter prior to the 1950 congressional authorization. The entire project was reviewed in 1959 in conjunction with the review of the Mississippi River and tributaries project. Numerous alternatives were considered at that time, including measures to prevent or mitigate anticipated losses to fish and wildlife and associated resources. Specific alternatives or modifications studied included:

(1) Deletion of significant portions of the channel work;

(2) A major water control structure and diversion of upstream flows;

(3) Acquisition of about 40,000 acres of wildlife lands;

(4) Strategic placement of excavated spoil materials;

(5) A floodway system; and

(6) Project abandonment.

Again, during the preconstruction phase of planning completed in 1969, those same alternatives were reconsidered, as well as additional diversions, levee systems, and reservoirs. Subsequently during fish and wildlife mitigation and general environmental studies, additional alternatives which included flood plain management techniques such as zoning and floodproofing, as well as flood insurance, were considered. Also structural measures such as changes in channel alinements to avoid damage to significant wildlife areas were adopted.

Senator BIBLE. What has been the result of your many studies?

Colonel EDGAR. These many studies of alternatives have resulted in modifications to the initial plans. Water control structures for fish and wildlife purposes are included. Measures to reduce esthetic damage are specified. Recommendations for acquiring and preserving significant acreages of constantly dwindling wildlife habitat are pend-

ing in the Congress. But, as yet, no sound and sensible alternative to channel improvement has been found which would solve the perennial flooding problems in the basin. The nonstructural alternatives such as zoning, of course, simply are not solutions to the problem of damage to existing developments. This is not to say that further serious consideration of alternatives has been foreclosed. An intensive environmental study is now underway in connection with preparation of a new project impact statement. A searching and careful reexamination is being made of all possible alternatives, both structural and nonstructural. We are confident that if there are, in fact, sound and sensible alternatives, they will be discovered and every effort will be made to implement them.

West Tennessee Tributaries

BUDGET REQUEST AND CAPABILITY

Senator Bible. The budget request was $350,000. The House committee has allowed $1,400,000 and local interests have requested $1,400,000. What is your capability on this project?

General Morris. Our capability on this project is now $1 million for land acquisition, Mr. Chairman, which is subject to authorization.

Senator Bible. What would be accomplished with the additional $650,000?

General Morris. The original budget request of $350,000 for construction is no longer required due to litigation delays. The entire $1 million capability would be used for acquisition of fish and wildlife mitigation lands, subject to authorization.

OPPOSITION

Senator Bible. Mr. Brent Blackwelder, representing the Environmental Policy Center, testified before this subcommittee:

"We are opposed to a continuation of this channelization which is draining prime wetlands in the heart of the Mississippi Floodway."

Have you considered this aspect in the planning of the west Tennessee tributaries project?

Colonel Edgar. Yes, sir. The review of the project, completed in early 1971, was for the purpose of determining what modifications to the project as authorized in 1948 are necessary to minimize adverse environmental effects. Proposed modifications to the project as a result of that review include measures to prevent drainage of prime wetlands.

Senator Bible. How will this be accomplished?

Colonel Edgar. The proposed modifications include acquisition of 14,400 acres of land as a Federal cost. These lands will include the prime wetland areas which have high value for fish and wildlife use and channel construction through these areas will consist of small channels with continuous levees on each side in place of channel enlargement to prevent drainage of the adjacent areas. Construction of the levees will include necessary provisions for overtopping during high flows. It is anticipated that most prime wetlands will be included in the areas presently owned by the Tennessee Game and Fish Commission and the additional proposed areas to be acquired.

Senator BIBLE. Have the proposed acquisition areas already been selected?

Colonel EDGAR. No, these will be jointly selected by the Corps of Engineers, the Department of Interior, and representatives of the State of Tennessee. However, it is anticipated that the most desirable lands for fish and wildlife use will be selected and this will include prime wetlands.

TENSAS BASIN, BOEUF AND TENSAS RIVERS

Senator BIBLE. The budget request was $2,450,000. The House committee has allowed $2,900,000, and local interests have requested $3,550,000. What is your capability on this project?

General MORRIS. Our capability on this project is $3,550,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $1,100,000?

General MORRIS. The additional amount would be used to advance relocations and construction of channel improvements.

TENSAS BASIN, RED RIVER BACKWATER AREA

Senator BIBLE. The budget request was $1,320,000. The House committee has allowed $2,600,000, and local interests have requested $6,450,000. What is your capability on this project?

General MORRIS. Our capability on this project is $6,450,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $5,130,000?

General MORRIS. The additional amount would be used to advance levee construction.

YAZOO BASIN, ARKABUTLA LAKE

Senator BIBLE. The budget request was $135,000. The House committee has allowed $135,000, and local interests have requested $135,000. What is your capability on this project?

General MORRIS. Our capability on this project is $135,000, the same as the budget, Mr. Chairman.

YAZOO BASIN, ENID LAKE

Senator BIBLE. There is no budget request and local interests have requested $20,000. What is your capability on this project?

General MORRIS. Our capability on this project is $20,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the $20,000?

General MORRIS. The amount would be used to advance construction of recreation facilities.

YAZOO BASIN, GRENADA LAKE

Senator BIBLE. There is no budget request and local interests have requested $40,000. What is your capability on this project?

General MORRIS. Our capability on this project is $40,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the $40,000?

General MORRIS. The amount would be used to advance construction of recreation facilities.

YAZOO BASIN, SARDIS LAKE

Senator BIBLE. There is no budget request and local interests have requested $50,000. What is your capability on this project?

General MORRIS. Our capability on this project is $50,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the $50,000?

General MORRIS. The amount would be used to advance construction of recreation facilities.

YAZOO BASIN, GREENWOOD

Senator BIBLE. The budget request was $20,000. The House committee has allowed $20,000, and local interests have requested $20,000. What is your capability on this project?

General MORRIS. Our capability on this project is $20,000, the same as the budget, Mr. Chairman.

YAZOO BASIN, UPPER AUXILIARY CHANNELS

Senator BIBLE. The budget request was $200,000. The House committee has allowed $1,100,000 and local interests have requested $250,000. What is your capability on this project?

General MORRIS. Our capability on this project is $1,100,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $900,000?

General MORRIS. The additional amount would be used to advance planning and construction on upper auxiliary channels.

YAZOO BASIN, MAIN STEM

Senator BIBLE. The budget request was $320,000. The House committee has allowed $320,000, and local interests have requested $1,320,000. What is your capability on this project?

General MORRIS. Our capability on this project is $320,000, the same as the budget, Mr. Chairman.

YAZOO BASIN, TRIBUTARIES, ALL WORK EXCEPT ASCALMORE-TIPPO AND OPOSSUM BAYOUS

Senator BIBLE. The budget request was $650,000. The House committee has allowed $1,150,000, and local interests have requested $2,090,000. What is your capability on this project?

General MORRIS. Our capability on this project is $1,740,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $1,090,000?

General MORRIS. The additional amount would be used to advance relocations and construction of levees at Panola-Quitman Floodway,

Teoc Creek and Yalobusha River, channel improvement at David Bayou Extension and Pelucia Creek and Hillside Floodway water control structure.

YAZOO BASIN, ASCALMORE-TIPPO AND OPOSSUM BAYOUS

Senator BIBLE. The budget request was $250,000. The House committee has allowed $350,000, and local interests have requested $500,000. What is your capability on this project?

General MORRIS. Our capability on this project is $350,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $100,000?

General MORRIS. The additional amount would be used to advance planning.

YAZOO BASIN, BIG SUNFLOWER RIVER, ET CETERA, INCLUDING STEELE BAYOU

Senator BIBLE. The budget request was $525,000. The House committee has allowed $525,000, and local interests have requested $1 million. What is your capability on this project?

General MORRIS. Our capability on this project is $1 million, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $475,000?

General MORRIS. The additional amount would be used to advance highway and utility relocations and channel improvement on Steele Bayou.

YAZOO BASIN, YAZOO BACKWATER EXCEPT MUDDY BAYOU

Senator BIBLE. The budget request was $400,000. The House committee has allowed $800,000 and local interests have requested $3,225,000. What is your capability on this project?

General MORRIS. Our capability on this project is $2,125,000. Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $1,725,000?

General MORRIS. The additional amount would be used to advance construction of certain channel and levee items.

YAZOO BASIN, YAZOO BACKWATER, MUDDY BAYOU

Senator BIBLE. The budget request was $1,100,000. The House committee has allowed $1,250,000 and local interests have requested $1 million. What is your capability on this project?

General MORRIS. Our capability on this project is $1,250,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $150,000?

General MORRIS. The additional amount would be used to advance construction of levees in Yazoo Backwater.

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YAZOO BASIN BANK STABILIZATION, MISS.

Senator BIBLE. There is nothing in the budget, and local interests have requested $900,000. What is your capability on this project?

General MORRIS. Mr. Chairman, our capability on this project is $900,000 to initiate construction, subject to authorization.

Senator BIBLE. Would you submit a statement for the record?

General MORRIS. Yes, sir.

[The statement follows:]

Project: Yazoo Basin Bank Stabilization, Mississippi

Summarized Financial Data:

Estimated Federal Cost	$9,500,000 1/
Estimated Non-Federal Cost	0
Total Estimated Project Cost	9,500,000
Allocations to Date	50,000
Balance to Complete	9,450,000
Amount that could be utilized in FY 1974	900,000

1/ Based on July 1971 prices.

Authorization: Not authorized.

Location and Description: The Yazoo Basin comprises 13,400 square miles in northwestern Mississippi. Some 6,600 square miles are a part of the alluvial flood plain of the Mississippi with the additional 6,800 square miles in the hill area. The project provides for a coordinated program for planning and construction of prototype streambank stabilization at locations in both delta and hill portions of the Yazoo Basin. The results of this construction will be analyzed and a report submitted reviewing this work and the nature and extent of the bank erosion problem in the entire basin.

Proposed Operations: The amount of $900,000 would be used for initiation of planning and construction of bank stabilization.

Justification: The streams in the Yazoo Basin experience varying degrees of bank erosion problems. Bank stabilization will prevent the loss of highly productive lands and improvements from destruction and will prevent damage to flood control works in the basin. A majority of the counties in the project area are designated Redevelopment Areas. The construction of the project would have a beneficial effect on the economy of the area by alleviating unemployment and under employment and raising the general level of income. A study of approximately 125 miles of bank stabilization works, at a cost of $43,000,000, found justified in the Yazoo Basin shows a benefit-cost ratio of 1.6 to 1. Average annual benefits for the 125 miles of bank stabilization are estimated as follows:

Prevention of Bank Caving	$5,890,000
Area Redevelopment	841,000
Total	$6,731,000

Remarks: Although approximately 125 miles of bank stabilization works, at a cost of $43,000,000, have been found needed and economically justified in the Yazoo Basin, it is considered that a pilot program for bank stabilization in the basin would be most beneficial at the present time. This pilot program of construction of various types and combinations of structures in prototype, and an analysis of the results, could be accomplished for $9,500,000.

Lower Red River—South Bank Levees

Senator Bible. The budget request was $600,000. The House committee has allowed $900,000, and local interests have requested $1,900,000. What is your capability on this project?

General Morris. Our capability on this project is $1,900,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $1,300,000?

General Morris. The additional amount would be used to advance construction of levees.

Atchafalaya Basin

Senator Bible. The budget request was $11,000,000. The House committee has allowed $15,000,000, and local interests have requested $28,200,000. What is your capability on this project?

General Morris. Our capability on this project is $28,200,000, Mr. Chairman.

Senator Bible. What would be accomplished with the additional $17,200,000

General Morris. The additional amount would be used to advance construction of floodwalls, levees, and drainage structures.

Harris Fork Creek, Tenn. and Ky.

Senator Bible. There is nothing in the budget, and local interests have requested $300,000. What is your capability on this project?

General Morris. Mr. Chairman, our capability on this project is $30,000 to initiate preconstruction planning, subject to authorization of the project by Congress.

Senator Bible. Would you submit a statement for the record?

General Morris. Yes, sir.

[The statement follows:]

Project: Harris Fork Creek, Tennessee and Kentucky

Summarized Financial Data:

Estimated Federal Cost		$2,813,000
Estimated Non-Federal Cost		454,000
Cash Contribution	$ 0	
Other	454,000	
Total Estimated Project Cost		$3,267,000
Allocations to Date		0
Balance to Complete		2,813,000
Amount that could be utilized in FY 1974		30,000

Authorization: Not authorized.

Location and Description: The project is located in the city of Fulton in Fulton County, Kentucky, and the city of South Fulton, Tennessee and Obion County, Tennessee. Harris Fork Creek has a total drainage area of 51 square miles and flows about 13 miles through the two towns to its confluence with the North Fork Obion River about 5 miles southeast of Union City, Tennessee. South Fulton Branch has a drainage area of about 9.3 square miles and flows through South Fulton, Tennessee to its confluence with Harris Fork Creek in the city. The project provides for construction of about 1 mile of concrete lined channel through Fulton, Kentucky and South Fulton, Kentucky, and channel enlargement for about 10 miles downstream to its confluence with the North Fork Obion River.

Proposed Operations: The amount of $30,000 would be used to initiate preconstruction planning.

Justification: This project will provide for both urban and rural flood control with benefits to begin upon completion of construction. A high degree of protection will be provided for approximately 180 urban acres and a lower degree of protection will be provided for 2,030 rural acres. Protection will be provided to 149 homes, 51 commercial establishments, and 4 manufacturing firms in the urban areas. Historical flood data and damage data for the Harris Fork Creek is limited. The earliest flood for which data is available is that of June, 1945 which caused damages of about $57,000 (1945 dollars), with damages minimized by intensive local flood fighting efforts. Damaging floods have also occurred in 1944, 1957, 1964, and 1970. Estimated average annual damages without the project are $217,000. With the project, residual average annual damages would be $3,000. The benefit-to-cost ratio is 1.8 to 1. The average annual benefits for the project are broken down as follows:

Flood Control	$310,600
Area Redevelopment	27,900
Total	$338,500

Senator BIBLE. The budget request was $34 million. The House has included $42,967,000 and local interests have requested $60,980,000. What is your capability on this project?

General MORRIS. Our capability on this project is $61,250,000, Mr. Chairman.

Senator BIBLE. What would be accomplished with the additional $27,250,000?

General MORRIS. The additional amount of $27,250,000 would be applied as follows:

PROJECT: FLOOD CONTROL, MISSISSIPPI RIVER AND TRIBUTARIES—MAINTENANCE

The total capability in fiscal year 1974 for Maintenance is $61,250,000; an increase of $27,250,000 over the budget request of $34,000,000.

The additional amount of $27,250,000 would be applied as follows:

Atchafalaya Basin	$3,796,000
Bonnet Carre Spillway	175,000
Dredging	4,000,000
Revetments and Dikes	6,892,000
Inspection of Completed Works	13,000
South Bank Arkansas River	320,000
Lower Red River	480,000
Mapping	21,000
Mississippi River Levees	3,120,000
Old River	1,367,000
St. Francis River and Tributaries	120,000
Wappapello Lake	50,000
Boeuf and Tensas Rivers	75,000
Red River Backwater	144,000
White River Backwater	50,000
Yazoo Basin	(6,627,000)
Arkbutla Lake	789,000
Enid Lake	344,000
Greenwood	174,000
Grenada Lake	2,227,000
Main Stem	601,000
Sardis Lake	2,215,000
Will M. Whittington Auxiliary Channel	277,000
Total	27,250,000

GENERAL INVESTIGATIONS

Senator BIBLE. Now, let me see if I understand what the House committee did under the Corps of Engineers appropriations.

For General Investigations, your budget request was $52.9 million, and the House committee allowed you $53.939 million.

Construction, General, you asked for $858,517,000, the House committee allowed you $864,569,000, which is $6,052,000 more than you had requested.

On Flood Control, Mississippi and tributaries, you asked for $110 million and the House committee gave you $139 million, an increase of $29 million.

I am sure after the testimony we heard yesterday from General Noble that that amount simply is going to be completely inadequate in view of the damage caused along the Mississippi River and its tributaries, and I hope you will press forward and get that amended budget request to us before we go to markup sometime in the middle of July.

Operation and Maintenance, you requested $413 million, the House committee allowed $403,625,000, a decrease of $9,375,000.

In flood control and coastal emergencies, you requested $7 million, the House committee allowed $7 million.

General expenses, you requested $32,883,000, the House allowed you that amount.

Special recreation use fees, you requested $1 million, and you were allowed a million.

And so the House allowance in total is $26,716,000 more than you requested.

I have no personal questions to ask you.

Senator Hatfield?

Senator HATFIELD. Mr. Chairman, I have some very short comments I would like to make at this point and then just ask a couple of questions.

Senator BIBLE. Certainly.

DREDGING IN PACIFIC NORTHWEST

Senator HATFIELD. General Morris, three questions arose out of testimony at the public hearings we had relating to the small Oregon coastal ports and the dredging problems——

General MORRIS. Yes, sir.

Senator HATFIELD [continuing]. I have discussed before.

As I understand it, there are presently four seagoing hopper-type dredges along the Pacific coast. Operating are the *Biddle*, *Harding*, *Davison*, and *Pacific*. The *Davison* has given service in Vietnam, and now having returned to the Pacific coast area, it will soon be transferred away from the coast of Oregon to some other area, and if it is transferred from the west coast, the *Pacific* is the only hopper dredge that can serve the smaller Oregon ports such as Umpqua, Chetco, Coquille, Siuslaw, and as this particular dredge was built 36 years ago, some of the present day safety standards as well as the efficiency are rather limited. In other words, there is a general obsolescence that surrounds this particular dredge.

MORATORIUM ON CONSTRUCTION OR REHABILITATION OF DREDGES

Now, as I understand, there was a moratorium placed upon the Corps, a moratorium by both Appropriations Committees relating to new construction or rehabilitation of the Corps dredges.

As I understand the picture, there has been some opposition from private dredging companies, the contractors, who felt the Corps was in competition with private industry on this issue, which led or at least gave impetus to the moratorium being established.

If those facts are basically correct, then I would like to proceed to three questions.

Under the existing moratorium, I assume that the Corps has not programed any funds for the rehabilitation of the dredge, *Pacific*, is that right?

General MORRIS. That is correct.

Senator HATFIELD. If the moratorium were not in effect, would the Corps proceed with a program of rehabilitation based upon funding

by the Congress to either replace or to rehabilitate the obsolete character of the *Pacific?*

General MORRIS. Senator, we would either replace or rehabilitate the *Pacific.* There would have to be some design work performed before we could proceed with replacement or rehabilitation.

PRIVATE DREDGE INDUSTRY

Senator HATFIELD. Do you know of any privately owned ocean-going or sea-going hopper dredge now in existence in the United States which would be capable of operating in the open exposed areas of sea, such as along the Pacific coast, as opposed to pipeline dredges?

General MORRIS. I am not aware of any. I don't know if Colonel Driscoll has.

Colonel DRISCOLL. No, sir.

General MORRIS. I don't believe there is, sir, although there has been a specific program or effort on the part of the Corps to develop within the private sector, or at least to cooperate in the development of some capability in this area. However, to my knowledge, the private dredging industry does not have a hopper dredging capability.

Senator HATFIELD. In fact, General Morris, it would be a rather difficult project to develop under private initiative because of the economics, the period of time that dredging would occur, and so forth.

General MORRIS. Yes, sir. That was one of the major considerations.

Senator HATFIELD. I have only asked these questions to make the record clear, because I think when the moratorium was placed by the House and the Senate Appropriations Committees, they failed to distinguish between a hopper ocean-going dredge and a pipeline dredge. There is a very important difference because there are no hopper type dredges under private ownership. Only the Corps operates hopper dredges, and by having this kind of moratorium placed upon rehabilitation and rebuilding of obsolete dredges we are really putting bad money after good money by not being able to keep our harbors and exposed channels open. In the case of pipeline dredges, which are designed for operation in protected waterways and channels, private industry does have a capability to handle this type of work. Thus, at the appropriate time I would like to move to lift the moratorium that the committee has placed upon rehabilitation of dredges, on the hopper dredges. I am not trying to get it lifted on the pipeline dredges, but I think on the hopper dredges it would be very important to address ourselves to that problem.

Senator BIBLE. The House has made some comments on the rehabilitation of dredges in their report and I would like to have you develop that, Senator Hatfield. Senator Bellmon?

LAND USE PLANNING

Senator BELLMON. Mr. Chairman, I have only one question I would like to put to General Morris. Perhaps it is not possible to do this on the bill we are considering.

But I think the General knows of the concern that we have in Oklahoma about the lack of land use planning in areas which have been protected by Corps structures and, in spite of the good intentions of

local officials and State officials, years have gone by and literally nothing has been done.

I have been toying with the idea of putting into this bill, Mr. Chairman, at least suggesting we put into the bill some language to the effect that the appropriations for the new projects not be eligible for expenditure until and unless the Chief of Engineers certified that adequate land use plans were in existence or were being developed.

Could you comment on that? What would be your reaction?

Senator BIBLE. What would that do to you?

General MORRIS. My first reaction is that it puts us in the position of being at the convenience of the States who have to pass this legislation. The land use planning legislation is a State responsibility.

Senator BELLMON. Would that serve as an incentive to the States to go ahead and get their land use planning done and their flood plain planning done?

General MORRIS. Presumably it should. There are other ways of getting the job done.

Senator BELLMON. For example?

General MORRIS. Well, we have a flood plain information study service which we can provide. As the Senator knows, these studies are initiated at State or local request. We cannot impose it on them.

Senator BELLMON. This is the problem. The States get into a conflict between State and local governments and there is a hiatus and nothing happens. What I would like to do is structure it in such a way that the chief, at his discretion, could say that an adequate plan is being developed in which case, he could go ahead with the project, or he would have the authority to say to the Governor or to the local municipality, sorry, we can't go forward until you come up with a land use plan. The problem we have, as you well know, is a lot of areas for which you have projects planned or are protecting are being developed in totally undesirable ways.

General MORRIS. It certainly is a problem, particularly on the older projects. On some of the newer ones immediate downstream areas are being worked into the project formulation and planning, relieving the potential for incompatible land use planning somewhat.

I would agree that anything that had a more forceful effect of developing good land use planning in the downstream areas of the flood plains would be very advantageous. I would certainly like the opportunity to consider the aspects of this, particularly that which places the responsibility and authority in the hands of the Chief of Engineers. My initial reaction is it has merit.

Senator BELLMON. Mr. Chairman, would it be in order for us to try to work out some language?

LEGISLATIVE COMMITTEE MATTER

Senator BIBLE. It might be. However, this is the first time I have heard the suggestion made, and I want to analyze it. It occurs to me this might more properly be a matter for the legislative committee. I think they should have hearings on it and departmental positions on it and I would think that might be the more orderly way to do it. I think it might be helpful if you speak to the Chairman of the Public Works Committee and see what, if any, testimony they have. We don't

have this particular problem and we haven't had it. We have developed a land use plan in Nevada. The last legislature adopted one. I think it is an absolute must if we are going to develop our land systematically and intelligently.

General MORRIS. If I might, Senator Bible, the more recently authorized projects in our appropriation request are better in this respect. For newer projects included in our appropriation request land use planning downstream is a factor which has been considered in the plan leading up to authorization.

Senator BIBLE. It might engender a lot of opposition, I don't have the slightest idea, but I do think it is a matter of legislating on appropriation bills and we would have to have a two-thirds vote, a two-thirds majority to permit us to put it in the bill. I think it is legislation on an appropriation bill and it may be worthwhile legislation. It may be the only way to force compliance by the States in trying to clean up a very, very sticky problem, but I would like to take a look at it and discuss it with others.

Senator BELLMON. You are of the opinion if the language was attached to this bill it would be subject to a point of order?

Senator BIBLE. I would think so. I always like to check with the parliamentarian. Sometimes I am wrong on it, but I would suggest the Senator from Oklahoma likewise check.

Senator BELLMON. Let me say then that I will try to work with General Morris and with the Department of Interior. Perhaps when the bill comes before the full Senate we may have an amendment to offer.

Senator BIBLE. Certainly, that is your privilege.

Further questions?

COMPREHENSIVE DREDGING STUDY

Senator HATFIELD. I would like to go back a moment to pick up on this subject of the dredges.

Senator BIBLE. Certainly.

Senator HATFIELD. The House language in the House committee report indicates that they want to maintain the moratorium against any rehabilitation or rebuilding of existing dredges until a study is completed. As I see the language here, it indicates a study is just now underway.

Can you give me a progress report on that study and what your projection is?

General MORRIS. I will be happy to, sir. We undertook this study about a year ago and in developing how to go about it, I decided that we should not make this a Corps of Engineers study if it was going to have credibility with private dredging interests. So, we set up a steering committee or advisory committee, if you wish, which was comprised of two members of the dredging industry, four retired corps employees, and two members representing the port authorities that use the facilities.

We had an eight-man committee, and thought things were going along fine. About last October or September an Executive order was issued which said that the membership of such committees had to be cleared with OMB. It took 5 months to get all of the members certified.

As a result, we are just getting underway and the committee is now functioning. Several meetings have been held to discuss problem areas, and to answer your question directly, we should have the first fruits of their efforts I would say in 9 months.

PERFORMANCE RESPONSIBILITIES

Senator HATFIELD. Well, General, the objective of this committee is to try to delineate or define the responsibilities that can best be performed by private industry and those which can best be performed by Government as they relate to dredging systems?

General MORRIS. Yes, sir, and one of the questions that has to be addressed, is whether there is a role for the Federal agencies in pipeline dredging or should it all be handled——

Senator HATFIELD. Your observations up to this point indicate that the economics do not justify private development of the hopper type dredge; is that right?

General MORRIS. Yes, sir; this study must address primarily the pipeline problem because at the present there is no commercial capability in the hopper dredge business.

Senator HATFIELD. This study which is referenced in the House is to the pipeline dredge, not to the hopper?

General MORRIS. Sir, it does include hopper dredges as well. But, as a practical matter we are most concerned with the pipeline field because the competition from the private sector does not exist in the hopper field. The *Comber* is a hopper dredge, incidentally, this is one section of the House report that we are having a little trouble with.

Senator HATFIELD. But with the *Comber*-class dredge, being a hopper-type dredge, we still have to face up to the same economic problems, don't we, as to the future ownership of that type of operation?

General MORRIS. Yes, sir, that is correct.

FEDERAL SUBSIDY OF HOPPER-TYPE DREDGE

Senator HATFIELD. Is there any conceivable way that you can think of the possibility of a hopper-type dredge being a practical operation under private ownership?

General MORRIS. I guess one way is if you took one of ours and let them have it.

Senator HATFIELD. A Federal subsidy?

General MORRIS. In a sense.

Senator HATFIELD. So the free enterprise system that people want to make sure exists throughout this industry would only be by Federal subsidies. Is that what I understand?

General MORRIS. We are considering the feasibility of using Government equipment and contractor operation to develop their experience and expertise.

Senator HATFIELD. I think the General has made a very excellent case here today that even supports further my contention that we are not facing reality if we think we are going to have a hopper-type dredge functioning under strictly private development and private ownership without some kind of a public subsidy, is that right?

General MORRIS. Well, I don't know that I would go quite that far. I think that is one way to do it. The expertise just has not been developed in the American dredging industry either to build, finance or to operate a hopper-type dredge.

Senator HATFIELD. But in the meantime——

General MORRIS. I would surmise it is going to happen. It is not here yet.

Senator HATFIELD. In the meantime our ports are still facing the day-to-day problem of maintaining a viable transportation system that we are investing other Federal funds to help develop.

General MORRIS. Yes, sir.

Senator HATFIELD. I know you can't make hard and fast promises, but it seems to me if this is going to be the holdup before we can resolve the question between the pipeline and hopper-type dredge operations, there should be no transfer of the *Davison* out of the Northwest. It is one of only two units capable of maintaining these ports to authorized depths.

General MORRIS. Well, sir, we are obligated to do the work up there and please don't interpret these comments as an indication that we are in fact transferring the *Davison*. It is under consideration and it is a very attractive consideration because we need to clean up some of the sediment in the lower Mississippi as a result of the recent floods. Once that is caught up with, I would presume the *Davison* will be available. The immediate problem we must address is in the lower Mississippi, but we are still responsible to do the work that is necessary in the Northwest, and we will do that.

Senator HATFIELD. I appreciate very much your response, General Morris.

Mr. Chairman, I shall continue to press within the committee for the lifting of the moratorium, even in conflict with the House, thinking at this point of the hopper-type dredge rehabilitation, especially as that might relate to the *Pacific*. I think there is full justification to do that without waiting for a study that is primarily directed at another type of dredging operation.

Senator BIBLE. I understand, I think you have made a very fine record and I think you should have language ready to be put in the Senate report and resolve it in the conference.

ARKANSAS-RED BASINS CHLORIDE CONTROL, OKLA., TEX., AND KANS.

Senator BELLMON. General, I see that in the House report a total of $800,000 was included for the Arkansas Red River salt control project which combined with the $400,000 that is left over gives $1,200,000. The report says this is for planning of selected sites in Oklahoma, Texas, and Kansas.

Do you have any breakdown as to where these funds will likely be used, which river system?

General MORRIS. Yes. Most of that $1,200,000 would be in the Red River system—I am speaking in round numbers—about $1,000,000 would be in the Red River system in an effort to bring parts I and II of the Red River system into a single analysis so that we can begin to build part of the system. Some of those will be in Oklahoma and some in Texas but it is the Red River system. The remaining amount would be spent on the Arkansas.

Senator BELLMON. Is there some reason for giving priority to the Red over the Arkansas?

General MORRIS. The reason is that the solution to the Red problem at the outset of this study was much easier to identify. The immediate results of that were greater and at the outset it was divided into two parts, part I and part II, and most of those were in the Red system. Some of the largest salt deposit areas are in the Arkansas. The basis for the priority was that the Red could be addressed more quickly and solved more easily. They got ahead of that in the authorization and postauthorization planning process.

Senator BELLMON. What needs to be done to bring the Arkansas up to speed?

General MORRIS. Sir, I would believe at this stage of the development we should proceed rapidly to establish Red River technical and economic feasibility to get the Red River system under construction and then as funds become available, bring the Arkansas along with it. The benefits to the Red system will be felt all the way down the river, both sides, Arkansas, Texas, and Oklahoma. The Arkansas system is much smaller in terms of sites and it should be able to catch up quickly.

Senator BELLMON. What time frame are you thinking about for completion of these projects?

General MORRIS. We would like to get the planning finished on the Red River sites within the next couple years so we could start work on them in fiscal 1976. The Arkansas shouldn't be too far behind.

Senator BELLMON. Completion by when?

General MORRIS. Of construction? It is several years beyond; it's going to take quite a while to build these because there are eight individual sites in the Red and I think four in the Arkansas.

CORPS CAPABILITIES

Senator BIBLE. I have two more questions, General Morris, one from the chairman, Senator McClellan.

What is the Corps capability for land acquisition on the Felsenthal portion of the Ouachita and Black River project?

General MORRIS. Subject to the usual qualifications, the total capability would be $9,800,000, or $5 million over the budget request. The additional $5 million would be for land acquisition at Felsenthal.

Senator BIBLE. We have also been requested to inquire as to the Corps of Engineers full capability on the Mississippi River and tributaries project. Yazoo Backwater area. Apparently there is some confusion about their capability in that area.

General MORRIS. The full capability for Yazoo Backwater, exclusive of Muddy Bayou, is $2,125,000, subject to the usual qualifications.

Senator BIBLE. We have 2 minutes to get to the floor. I have no further questions. Thank you for coming. The hearing will be recessed while we go vote.

[Short recess.]

DEPARTMENT OF THE INTERIOR

Bureau of Reclamation

STATEMENT OF W. H. KEATING, ACTING COMMISSIONER

ACCOMPANIED BY:

D. D. ANDERSON, ACTING ASSISTANT COMMISSIONER FOR ADMINISTRATION

W. W. WILSON, CHIEF, PROGRAM COORDINATION AND BUDGET BRANCH

RECALL TESTIMONY

Senator Bible. The hearing will come to order.

We will next go into the items of the Bureau of Reclamation. Does the Bureau have the questions that were raised by the various Members of the Congress and other witnesses? Have they been submitted to you?

Mr. Keating. They have been.

Senator Bible. Fine, they will be incorporated as a part of the record.

You may identify yourself.

Mr. Keating. Yes, sir. I am Bill Keating, Acting Commissioner while our Commissioner is in Mexico this week, and I have with me Mr. Don Anderson, who is our Acting Assistant Commissioner for Administration, and Mr. Hank Wilson of our financial management group.

Senator Bible. Very well.

QUESTIONS SUGGESTED BY SENATOR MOSS

I have a series of additional questions that were suggested to me by Senator Moss and I will submit them to you and let you supply them for the record.

Mr. Keating. I will be glad to.

[The questions and answers follow:]

Q. Did not the Bureau of Reclamation develop a plan, 2 or 3 years ago, for implementation of its project Skywater extending over a period of several years?

A. The Bureau published in November 1966 a "Plan to Develop Technology for Increasing Water Yield from Atmospheric Sources," designed to implement a nationwide program for Project Skywater through 1985.

Q. What were the projected funding levels for this plan for experimental research and development as contemplated beginning with FY72 for the first 5 years?

A. In 1966, the projected funding requirements in this plan for the period FY72 through FY75 were $57 million, $53 million, $52 million and $53 million, respectively; however, the budget prepared in FY71 requesting $6.8 million for that year projected funding requirements for FY72 through FY76 of $10.35 million, $17.328 million, $27.336 million, $39.349 million, and $45.356 million, respectively.

Q. Was not the basic objective of this plan to obtain information in order to supplement, if desired, an operational program of orographic cloud seeding in the Wasatch and Rocky Mountains with a high degree of reliability?

A. In 1971, as part of the Project Skywater program, the Bureau negotiated a contract with Utah State University to undertake a 3-year effort to conduct research and develop an operational precipitation management system for the Wasatch Mountains area which could be integrated into an overall water management program. This was the third contract to continue the precipitation management research effort begun at Utah State in 1965 for Project Skywater.

Q. Does the Bureau of Reclamation now have a reliable evaluation and a methodology which would permit engineered programs of operational cloud seeding of winter orographic storms in this area with a high level of confidence in their results?

A. With a comprehensive analysis and evaluation of the work completed to date at Utah State and in other Project Skywater winter research projects, including the pilot project in the San Juan mountains of Colorado, we expect to have an initial level of cloud seeding technology that could be used operationally in winter orographic storms in the West. Further research will be needed, however, to improve the technology and study the long-range effects of large-scale operational cloud seeding and precipitation management.

Q. Is not the water problem in the Colorado Basin extremely critical in terms of both quality and quantity?

A. Yes, and we believe that precipitation management can provide an economical source of additional clean water. We have estimated

that approximately 2 million acre-feet of additional runoff into the Colorado River can be provided at a cost of about $1.50 per acre-feet by a carefully controlled operational cloud seeding program in the Upper Colorado River Basin. This estimate has been concurred in by a technology assessment performed by Stanford Research Institute under contract to the National Science Foundation, and verified thus far, by test results in our Colorado River Basin Pilot Project.

Q. What level of funding does the Bureau of Reclamation contemplate for experimental research on winter orographic cloud seeding under the Administration's FY74 budget?

A. Two pilot projects will cost a total of $860,000 in FY74. An additional $40,000 will be spent on other winter orographic cloud seeding research.

Q. What was the actual FY73 budget and how much was devoted to experimentation on orographic cold cloud systems?

A. The FY73 budget for Project Skywater was $6,370,000. A total of $3,000,000 was spent for winter research which included $1,000,000 for the two pilot projects.

Q. What new programs were initiated under the FY73 budget? What new ones are contemplated under the Administration's FY74 budget?

A. The only major field experiment begun in FY73 was to conduct a multibasin cumulus cloud seeding experiment in the Southern Great Plains (Oklahoma). Several small studies were initiated to assess environmental and socioeconomic effects of cloud seeding. The only new effort planned for in our FY74 budget is the High Plains Cooperative Program.

Q. Was the 3-year Utah State University contract developed 2 years ago a reasonable optimal plan for achieving results that could lead to operational cloud seeding of winter orographic storms in the Wasatch and Rocky Mountains?

A. The Utah State University contract was conceived as a two-part program. The first year would concentrate on collecting and analyzing the data needed to develop the techniques for treating winter storms over the Wasatch Mountains, and designing an operational demonstration of these techniques. The second and third years would emphasize testing the operational application of the precipitation management system. The design for an operational demonstration was not considered acceptable, nor was funding made available to the Bureau to pursue this phase of the project.

Q. Was the contract made with the Utah State University to cover the period FY71-74 conceived as being a necessary and important component of the Skywater program?

A. At the time the contract was negotiated, it was considered an important component of the total Project Skywater program.

Q. What was the estimated cost of that contract and how was it phased?

A. Total estimated cost of the contract was $1,500,000 for 3 years. This amount was further scheduled for payment as follows:

	Research	Operations	Total
FY 1972	$400,000	$ -0-	$ 400,000
FY 1973	370,000	230,000	600,000
FY 1974	300,000	200,000	500,000
			$1,500,000

Q. What allocations and expenditures have been made so far each year?

A. Including the earlier contracts for precipitation management research with Utah State University, the following funds have been allocated:

FY 1965	$ 20,000
FY 1966	150,000
FY 1967	150,000
FY 1968	246,000
FY 1969	230,000
FY 1970	330,000
FY 1971	400,000
FY 1972	379,000
FY 1973	365,000
	$2,270,000

Q. This project was somewhat unique in having the most extensive automated network of data collecting stations installed anywhere. Presumably the Skywater program counted heavily on such an experiment to obtain the kind of information needed to determine the effectiveness of different seeding techniques applied to different cloud systems. Is this correct? Did the plan of work outlined and accepted for the current Utah State University contract constitute a coherent and carefully sequenced set of activities for obtaining information needed to ultimately design full-scale operations programs?

A. The data collecting network has been in use since 1967 to obtain information needed to determine the effectiveness of cloud seeding. A comprehensive analysis of these data will be a valuable input to the development of an initial cold orographic cloud seeding technology by Project Skywater.

Q. Is the Bureau of Reclamation initiating or cooperating with any of the Rocky Mountain States in carrying cold cloud seeding to operational status? How can we justify the initiation of new studies (such as the High Plains Experiment) and at the same time abandon operational pay-off within our grasp by terminating carefully conceived and productive programs already contracted for?

A. The Bureau does not have authority to conduct operational cloud seeding. We have, however, offered technical assistance and limited use of instruments and other equipment to States inter-

ested in operational programs. The High Plains Experiment is a new study only in the sense that it is a redirection of our ongoing research efforts in that area aimed at accelerating the development of an acceptable, effective technology for seeding warm-type cumulus clouds and storm systems over the Plains area.

Q. Does not this plan jeopardize the tentative results of past work and the corresponding large expense without bringing the project to its completion? Why?

A. No. We believe that sufficient test cases in seeding cold orographic clouds are now available, and an analysis of the data from the Utah State experiments, along with the data from other Project Skywater experiments, will provide positive results and allow us to describe an initial level of technology for operational application under certain conditions.

Q. Does not the present plan let valuable capital equipment and installations suddenly become unused without finding out whether new programs free of capital expense can be initiated? Why?

A. We are supporting the University in seeking funds from other sources, such as the Soil Conservation Service and Utah Power and Light Company, to help operate the telemetered precipitation gauge network.

Q. Does not the present plan break up a carefully evolved and skilled team who has gradually developed expertise in this general field of activity? Was not this team developed in good faith by Utah State University based on the 3-year contract entered into beginning in FY72? Is not there some obligation to honor this commitment if at all possible?

A. Our information indicates that most of the professionals employed in this research project over the 9 years since its beginning are currently employed at other institutions including five former Project Leaders. There does not appear to be a skilled team at Utah State who has gradually developed expertise in precipitation management although certain individuals may have acquired specific skills which may be lost to Project Skywater. This is also true at most of the other projects being terminated in FY74.

The budget situation with regard to Project Skywater requires us to constantly evaluate and frequently reprogram efforts in each of our research areas to best utilize the funds that are made available to us, and to maintain a balanced program that will enable us to develop cloud seeding techniques that can be utilized in a nationwide precipitation management program. Although we feel that there is an obligation to honor commitments in contracts, it must be accomplished within budgetary limitations and with a consideration of the priorities within the total research program to achieve the objectives of the program.

Q. Would not a similar evolution have to take place at the new program sites?

A. This would be true if there were new program sites where the expertise was not available. The only possible new sites for FY 1974 are in connection with the High Plains Cooperative Program, where we anticipate that the competition among expert groups to participate will be keen, and the funds available will be insufficient to support all of these groups.

Q. Analyses by Utah State University scientists lead them to believe that $125,000 FY74 funding plus $125,000 carryover from FY73 is a minimum amount to salvage something worthwhile from the Utah State University phase of the Project Skywater activities? Do you feel that the appraisal of these scientists, who have the day-to-day responsibility for conducting the project, is a valid one?

A. The expenditure of the $125,000 of FY73 funds to complete the analysis of data obtained to date would have provided a valuable early input into Project Skywater efforts to describe an initial level of cold orographic cloud seeding technology. We have allowed a funding carryover of this amount into FY74 to complete this analysis, however, to ease the burden caused by the funding cut. We do not believe that an additional $125,000 in FY74 will be required to accomplish this task.

Basalt Project, Colorado—General Investigations

atmospheric water resources management program

Senator Bible. There is no appropriation request but local interests have asked for $25,000. What is your capability on the Basalt Project?

Mr. Keating. Mr. Chairman, we do not have immediate capability on this project. Our funds and available personnel have been scheduled for the current and budget year and for the estimated period through competition of our active investigation programs according to planning priorities which permit the initiation of only those studies which fulfill urgent needs. This study has potential for eventual inclusion in our general investigation program and it will be subject to further consideration in subsequent years in light of then existing priorities and goals.

Battlement Mesa, Colo.

Senator Bible. There is no appropriation request but local interests have asked for $50,000. What is your capability on the Battlement Mesa Project?

Mr. Keating. Mr. Chairman, we do not have immediate capability on this project when viewed in the light of overall program priorities. Recently, our funds and available personnel were subject to intensive scrutiny and our program has been cleaned to permit the initiation and continuation of only those studies which fulfill urgent needs. Eventually this study may meet the requirements for inclusion in the active investigation program dependent upon future national regional and local priorities and goals.

Central Utah Project, Uintah Unit, Utah

Senator Bible. There is no appropriation request but local interests have asked for $500,000. What is your capability on the Uintah Unit?

Mr. Keating. Mr. Chairman, we do not have a capability on this project. Our funds and available personnel have been scheduled in accordance with current planning priorities. These priorities permit the initiation of only those studies which will fulfill critical planning needs. These priorities do not now emphasize new agricultural developments. This study, although not included in the fiscal year 1974 program, will be given further consideration in subsequent years in light of then existing priorities and goals and budgetary conditions.

Central Utah Project, Ute Indian Unit, Utah

Senator Bible. The budget request for the Ute Indian Unit is $575,000. Local interests have requested $1,000,000. What is your capability?

Mr. Keating. Our capability is limited at this time to $575,000 as requested in the budget. This amount will permit continuation of an orderly program of study leading to completion in fiscal year 1974 of a feasibility report that could cover development of Utah's remaining share of Upper Colorado River water. Our remaining capability is needed to study potentialities for fulfilling other urgent needs.

Central Washington, East Banks Area, Wash.

Senator Bible. There is no appropriation request but local interests have asked for $100,000. What is your capability on the Central Washington project?

Mr. Keating. Mr. Chairman, our capability on this appraisal investigation is $100,000. These funds would be used to identify needs and determine multipurpose development potential in the East Banks area. Problems of the area are centered on but not confined to water-related fish and wildlife, recreation, municipal and industrial, irrigation and flood control needs. In addition, there is local interest in investigation cost sharing which is an idea we wish to endorse and allow, at least on a trial basis.

East Cache Segment, Bear River Project, Idaho–Utah

Senator Bible. There is no appropriation request but Senator Church and Senator McClure have asked for $80,000 to proceed with an updated feasibility study on this project. What is your capability on the East Cache Segment?

Mr. Keating. Mr. Chairman, we do not have a capability on this project especially in view of our currently limited potential for fulfilling other urgent study needs of the area. Our limited funds and available personnel have been scheduled to meet current budget and future year planning priorities which permit additional work on only those studies in fulfilling critical needs. This study although not recommended for inclusion in the fiscal year 1974 program, will be given future consideration in light of the then existing investigation priorities and goals.

Senator Bible. This is an M&I and irrigation potential. Since this project serves a priority planning need why don't we have capability?

Mr. Keating. Mr. Chairman, the fact that we have indicated no capability on this investigation is prompted by the inclusion of a significantly large irrigation potential along with the potential municipal and industrial development in the area. There is also a lingering difficulty in the potential project area, when looking at the Bear River Basin's available inter-State water supply, in reaching agreement upon development plans. Thus when currently weighed against other regional investigation potentials, in view of limited funds and personnel, we have indicated a preference to defer these potential studies so that other regional investigations might proceed on schedule. The investigations will be given further consideration in the immediate years ahead in light of then existing priorities and goals.

Geothermal Resource Investigations, Calif.

Senator Bible. The budget request for this project is $1,270,000 while local interests have requested $1,770,000. What is your capability?

Mr. Keating. Our capability is $1,770,000, an increase of $500,000 above the appropriation request.

Senator Bible. What would be accomplished with the additional $500,000?

Mr. KEATING. We would use these funds to expedite the geophysical exploration and the desalting program of the resource investigation being conducted in Imperial Valley of California. The object of this investigation is to develop the required technology and to determine the feasibility of developing the geothermal resources of the Imperial Valley and surrounding area in southeastern California for the purpose of supplying usable water for augmenting the Colorado River to help the United States in meeting its Mexican Treaty obligations and for agricultural and municipal and industrial development. The feasibility study on this investigation was started in fiscal year 1972 and is scheduled for completion in fiscal year 1979. The study currently enjoys very high priority among all other active items within our general investigation program, because of its potential impact upon general environmental problems and specific water supply needs of our country's most arid regions.

HIGHLAND UNIT, ELKHORN DIVISION, NEBR.

Senator BIBLE. There is no appropriation request but local interests have asked for $130,000. What is your capability on the Highland unit?

Mr. KEATING. Mr. Chairman, we do not have immediate capability on this project because of the current low Federal priority accorded irrigation development. Eventual inclusion of this investigation in our program will depend upon the significance of the growing need for agricultural produce as a matter of meeting national goals and policies. The project potential is basically one of irrigation, thus, it is not recommended for inclusion in the fiscal year 1974 program. It will, however, be subject to further consideration in subsequent years in light of then existing priorities and goals.

HOOD-CLAY CONNECTOR TO FOLSOM SOUTH CANAL, CALIF.

Senator BIBLE. There is no appropriation request but local interests have requested $50,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this feasibility investigation is $50,000. It would allow us to initiate the preparation of refined data and cost estimates on Hood-Clay unit. This unit represents a logical plan to assure meeting critical multipurpose needs of the Folsom South area for which construction is already authorized and provide adequate flows in the American River to produce a quality environment in the area and provide important recreation, esthetic, and fishery values in the Sacramento area.

LOWER JAMES-FORT RANDALL WATER DIVERSION, S. DAK.

Senator BIBLE. There is no appropriation requested but Senator Abourezk has asked for $150,000 to initiate a feasibility study on the Lower James-Fort Randall water diversion project. What is your capability on the project?

Mr. KEATING. Mr. Chairman, we do not have immediate capability on this investigation because of the current low priority given to Federal irrigation development. Eventual inclusion of this investigation in our program will depend upon the overall significance and

growth of agricultural needs in the country. Although this study does not now meet the requirements for inclusion in the fiscal year 1974 program, it will be subject to consideration in future years in light of the then existing national priorities and goals.

Senator BIBLE. This potential project would include service for municipal and industrial purposes. Why is there no capability?

Mr. KEATING. Mr. Chairman, even though a municipal and industrial water supply would be a purpose of the Lower James-Fort Randall unit, its principal purpose would be irrigation. With such projects being accorded a relatively low national priority, we have no capability to commence the study. If we were to study the unit, other studies with higher priority would have to be stopped.

LAKE ANDES-WAGNER UNIT, P–SMBP, S. DAK.

Senator BIBLE. Why don't we have a capability here?

Mr. KEATING. Mr. Chairman, the predominant function of the Wagner unit is irrigation of new land. With such projects being accorded a relatively low national priority, further studies of the Wagner unit have been discontinued.

We have no capability to continue investigations of the unit, because to do so, other studies which have been accorded a higher national priority would have to be terminated.

LOWER YAMPA PROJECT, COLO.

Senator BIBLE. The budget request for this project is $25,000. Local interests have requested $165,000. What is your capability?

Mr. KEATING. Our capability is limited at this time to $25,000 as requested in the budget. This is the amount needed in fiscal year 1974 to process a concluding report on this project which has been assigned a relatively low priority.

MIDDLE PARK PROJECT, COLO.

Senator BIBLE. There is no appropriation request but local interests have asked for $114,000. What is your capability on the Middle Park Project?

Mr. KEATING. Mr. Chairman, we do not have immediate capability on this project. Our funds and available personnel have already been scheduled to meet current, budget and future year planning priorities on the basis of a very tight budgetary outlook. Thus, reviewed in terms of the requested level of funding and potential future year budgetary requirements we will not recommend this study for inclusion in the FY 1974 program. The study will, however, be subject to future consideration in light of the then existing priorities and goals.

MONTEZUMA HILLS UNIT, DELTA DIVISION, CALIF.

Senator BIBLE. There is no appropriation request but local interests have requested $75,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this feasibility study is $75,000. These funds would help develop a waste water reuse pilot

demonstration project to investigate feasibility of the use of treated waste water for waterfowl habitat management in the Suisum Marsh. The Montezuma Hills Unit would provide water service for municipal and industrial and agricultural use in southeastern Solano County and to the 84,000 acre Suisun Marsh in southcentral Solano County. The starting emphasis on this investigation in FY 1974 would be on the Suisun Marsh area.

NORTH COAST FISH AND WILDLIFE SUPPORT STUDIES, CALIF.

Senator BIBLE. There is no appropriation request but local interests have requested $160,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this special study is $160,000. This would allow the Bureaus of Reclamation and Sport Fisheries and Wildlife and the State of California's Departments of Water Resources and Fish and Game to conduct a jointly financed interagency study. The emphasis on these studies is environmental. The studies are needed to identify solutions to problems which include excessive turbidity, sedimentation, declining fish run trends, vegetation encroachment into the stream channels, and reanalysis of wildlife mitigation attempts that have been unsuccessful.

ROGUE RIVER BASIN PROJECT, GRANTS PASS DIVISION, OREG.

Senator BIBLE. There is no appropriation request but local interests have requested $25,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this project is $25,000. Preliminary surveys would be undertaken to assess the rehabilitation needs of the Grants Pass Irrigation District, consider other water-related needs in the area, and collect available data relating to the multiobjective study. The study would include identification of a permanent solution to the anadromous fish passage problem at the District's Savage Rapids Dam; rehabilitation of existing irrigation facilities; service to additional District lands; as well as investigation of growing recreation and domestic water supply needs of the area.

SUBLETTE PROJECT, WYO.

Senator BIBLE. There is no appropriation request but local interests have asked for $100,000. What is your capability on the Sublette project?

Mr. KEATING. Mr. Chairman, our capability on this feasibility study is $100,000. These funds would be used to gather and analyze data for multipurpose economic and water supply studies and design purposes for this southwestern Wyoming project. The purpose would be to increase storage at the existing Boulder Lake and divert water to the Big Sandy for replacement of about 30,000 acre-feet annually which would be diverted to the North Platte River via the Sweetwater River for potential municipal and industrial use. It would also involve diversion from the East Fork and regulation on Big Sandy by Sanders Ranch Reservoir for additional irrigation water supplies.

UNCOMPAHGRE IMPROVEMENT PROJECT, COLO.

Senator BIBLE. There is no appropriation request but local interests have asked for $150,000. What is your capability.

Mr. KEATING. Mr. Chairman, due to carefully considered fund and personnel limitation and in view of other priority investigations programed for the area, our recommended capability on this feasibility investigation is $80,000. The funds would be used to study potential improvements of facilities in the Uncompahgre Project which is one of the the oldest existing Reclamation Projects. Canal and lateral lining to improve operation efficiencies, reduce annual project operation costs, and salinity and pollution problems would receive highest study priority.

UPPER YAMPA PROJECT, COLO.

Senator BIBLE. There is no appropriation request but local interests have asked for $170,000. What is your capability on the Upper Yampa Project?

Mr. KEATING. Mr. Chairman, we do not have immediate capability on this investigation. This is due to limitation of our funds and available personnel an occurrence which has required careful scrutiny of our investigation program for the local region and the entire west. This study, although not included in the FY 1974 program, will be subject to future consideration in light of the then existing water resources priorities and goals.

VENTURA COUNTY WATER MANAGEMENT PROJECT, CALIF.

Senator BIBLE. There is no appropriation request but local interests have requested $100,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this feasibility study is $100,000. These funds would enable us to complete the investigation, work plan, summarize present and future water requirements and existing and authorized future firm water supplies, and begin studies to determine the chemical quality of urgently needed present as well as future water supplies. The all inclusive nature of this total water management study should yield recommendations for optimizing use of the county's and potential water resources.

WYOMING AQUEDUCT STUDY, WYO.

Senator BIBLE. There is no appropriation request but local interests have asked for $400,000. What is your capability on the Wyoming Aqueduct Study?

Mr. KEATING. Mr. Chairman, we do not have immediate capability on this investigation. Our limited funds and available personnel have been scheduled to accomplish a program which has already been scrutinized to permit high priority studies. Although this study is related

to development of large coal reserves for meeting high priority energy requirements, there are other potential studies and studies underway that would have a bearing on the need for this study. Thus, this study is not recommended for inclusion in the fiscal year 1974 program, but could be subject to future year consideration in light of the then existing priorities and goals.

Yellow Jacket Project, Colo.

Senator Bible. There is no appropriation request but local interests have asked for $25,000. What is your capability on the Yellow Jacket Project?

Mr. Keating. Mr. Chairman, we do not have immediate capability on this project. Our regional funds and available personnel have been scheduled in accordance with planning priorities which permit the continuation and initiation of only those studies which fulfill the most urgent needs. Although this study is not presently recommended for inclusion in the fiscal year 1974 program, it will be subject to future consideration in view of the then existing priorities and goals.

BRANTLEY PROJECT, N. MEX. (ADVANCE PLANNING)

CONSTRUCTION AND REHABILITATION

Senator BIBLE. There is no appropriation request but local interests have asked for $300,000. What is your capability on the Brantley Project?

Mr. KEATING. Mr. Chairman, we do not have a capability on this project. In view of the limited budget that we have to work with in F.Y. 1974, we were not able to include advance planning for Brantley as well as for a number of other projects that are eligible for advance planning activities.

Senator BIBLE. Would you submit a statement for the record?

Mr. KEATING. Yes, sir.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost.....	$45,605,000
Allocations to date, including F.Y. 1973.....	-0-
Budget Request, F.Y. 1974.....	-0-
Balance to Complete after F.Y. 1974.....	45,605,000

Authorization: P.L. 92-514, October 20, 1972

Status:

The F.Y. 1974 budget request does not include any funds to initiate advance planning on this project. This project has been authorized and advance planning could be started as soon as funds are made available.

Location and Description:

The Brantley Project is located on the Pecos River in Eddy County, New Mexico, about midway between the cities of Artesia and Carlsbad. The plan consists of construction of Brantley Dam and Reservoir for the purposes of irrigation, flood and sediment control, safety of dams, fish and wildlife, and recreation. The project provides for replacement of irrigation storage for McMillan Reservoir which is losing its effectiveness because of sediment accumulation. McMillan and Avalon Dams are existing structures which presently serve the Carlsbad Irrigation District lands. Brantley Reservoir will provide storage for flood control not presently available in McMillan and Avalon Reservoirs and will eliminate the threat of failure, because of inadequate spillways, of McMillan and Avalon Dams. In addition, minimum pools would be provided for fish and wildlife enhancement and for recreational opportunities.

The benefit-cost ratio for this project is 1.07 to 1.0. The average annual benefits of $3,068,700 are broken down as follows:

Irrigation.....	$ 70,000
Flood Control.....	967,600
Safety of Dams.....	1,576,200
Recreation.....	297,200
Fish and Wildlife.....	157,700
Total.....	$3,068,700

AUBURN-FOLSOM SOUTH UNIT, CALIF. (AUBURN DAM AND POWER PLANT)

Senator BIBLE. The budget request for this project is $2,483,000 while local interests have requested $3,483,000. What is your capability?

Mr. KEATING. Our capability is $3,733,000, an increase of $1,250,000 above the appropriation request.

Senator BIBLE. What would be accomplished with the additional $1,250,000, and what is the difference between your capability and the requests from local interests?

Mr. KEATING. The local interests have requested an increase of $1,000,000 to advance the land acquisition program for the Auburn Reservoir. Our capability on this item is $1,250,000 for this land acquisition program. This is an area of rapidly rising land values and it is of course desirable to complete the program as quickly as funds can be made available.

AUBURN-FOLSOM SOUTH UNIT, CENTRAL VALLEY PROJECT, CALIF. (REACHES 3 AND 4 OF THE FOLSOM SOUTH CANAL)

Senator BIBLE. The budget request for reaches 3 and 4 of the Folsom South Canal is $150,000. Local interests have requested $300,000. What is your capability?

Mr. KEATING. The California Water Resources Control Board has issued its Decision 1400 concerning the flow requirements in the lower American River. If that decision becomes binding it could adversely affect the amount of water available for use in the Folsom South service area. Pending resolution of this matter, we believe the level of funding should not be increased.

AUBURN-FOLSOM SOUTH UNIT, CALIF. (SUGAR PINE DAM AND RESERVOIR)

Senator BIBLE. The budget request for this project is $500,000 while local interests have requested $750,000. What is your capability?

Mr. KEATING. Our capability of $750,000 agrees with the local requests. This amount is an increase of $250,000 above the appropriation request.

Senator BIBLE. What would be accomplished with the additional $250,000?

Mr. KEATING. These funds would be used to award the prime construction contract for the Sugar Pine Dam and for work on the access road. The reservoir when completed, will create 16,500 acre-feet of water to provide irrigation and municipal and industrial water supply to the Foresthill area. This additional water is needed to meet increasing demands from the various potential customers.

MISCELLANEOUS PROJECT PROGRAMS—CENTRAL VALLEY PROJECT, CALIF.

Senator BIBLE. The budget request for this project is $2,800,000 while local interests have requested $2,900,000. What is your capability?

Mr. KEATING. Our capability agrees with the local request for $2,900,000, an increase of $100,000 above the appropriation request.

Senator BIBLE. What would be accomplished with the additional $100,000?

Mr. STAMM. The fiscal year 1974 budget provides $170,000 for preconstruction on the El Dorado distribution system. An additional $100,000 could be effectively used to start construction of the system to provide irrigation service to about 25,000 acres in the Pleasant Oak area.

SACRAMENTO RIVER DIVISION, CENTRAL VALLEY PROJECT, CALIF.

Senator BIBLE. The budget request for this project is $8,545,000 while local interests have requested $10,713,000. What is your capability?

Mr. KEATING. Our capability is $9,545,000, an increase of $1 million above the appropriation request, rather than the $10,713,000 requested by local interests.

Senator BIBLE. What would be accomplished with the additional $1 million in your capability and explain if you will, the work that could be done within the total requested by local interests.

Mr. KEATING. The $1 million additional capability would be used to obtain land and land rights for reaches 5 and 6 of the Tehama-Colusa Canal. This additional amount would allow for most of acquisitions of land and land rights in fiscal year 1974 and help counter rising land costs.

The additional $1,168,000 requested by local interests over our added capability of $1 million is for preconstruction work on reaches 5, 6, 7, and 8 of the Tehama-Colusa Canal which is a more aggressive program than we now find possible of achievement.

SAN FELIPE DIVISION, CALIF.—ADVANCE PLANNING

Senator BIBLE. There is no appropriation request but local interests have requested $200,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this project is $200,000. This amount would be used to continue repayment contract negotiations and other preconstruction activities including test borings and engineering.

Senator BIBLE. Since this was not an item in the 1974 budget request would you submit a factsheet on this project for the record?

Mr. KEATING. Yes, sir.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost	$92,380,000
Allocation to date, including F.Y. 1973	1,102,335
Budget Request FY 1974	-0-
Balance to complete after F.Y. 1974	91,277,665
Capability in F.Y. 1974	200,000

Authorization: PL 90-72, August 1967

Status and Capability:

Advance planning is near completion. Work currently under way includes continuation of negotiations with service area interests, gathering preliminary geology and other data, and a modest program of geological drilling for Pacheco Tunnel. The Draft Environmental Statement will be submitted by June.

The F.Y. 1974 budget contains no funds for this program. An amount of $200,000 could be effectively used. This amount would - (1) continue contract negotiations, (2) continue preconstruction activities including test borings and engineering, and (3) explore possible changes in design alternatives to improve the environmental impact.

Location and Description:

This division is located in the Central Coastal area of California south of San Francisco. The division will provide a full irrigation supply to 14,700 acres, supplemental water to 31,159 acres and provide 223,300 acre-feet annually for municipal and industrial use. Water from San Luis reservoir through Pacheco Tunnel (10.3 miles) will be transported via 94 miles of canal, 10 miles of closed conduit. Four pumping plants, three small reservoirs as well as a distribution system with relift pumping units are other features of the project. The tunnel inlet was constructed under authority contained in the San Luis authorization act.

Declining water levels continue in the Hollister and Watsonville sub-areas. San Jose has obtained a temporary water supply at high cost from the State of California pending completion of the San Felipe conveyance system.

The benefit-cost ratio for this project is 2.76.

Senator BIBLE. The budget request for this project is $20,636,000 while local interests have requested $31,456,000. What is your capability?

Mr. KEATING. Our capability is $25,636,000, an increase of $5 million above the appropriation request.

Senator BIBLE. What would be accomplished with the additional $5 million and what work was contemplated by the local interests in the $4,820,000 they requested above your capability?

Mr. KEATING. Of the additional $5 million in the Bureau capability, $4 million would be used on the Westlands distribution system and on the related collector drain, and $1 million would be used for the turnout on the San Luis Canal required to serve the San Luis Water District loan. With the additional capability a contract would be awarded a lateral contract and for the drainage collector system and in addition contracts would be awarded for the relift facilities for the San Luis Water District loan distribution system. The relift facilities for the loan need to be started in fiscal year 1974 in order to provide delivery to the completed system in 1976. The request by the local interests would require a more aggressive program than we now find possible of achievement.

Senator BIBLE. Please submit a statement.

[The statement follows:]

Project: CENTRAL VALLEY--SAN LUIS UNIT, California
(Also see--San Luis Water District)

Appropriation: C&R

Summarized Financial Data:

Total Estimated Federal Cost.....	$13,200,000
Allocation to date, including F.Y. 1973.....	5,147,720
Budget Request, F.Y. 1974.....	150,000
Balance to complete after F.Y. 1974.....	7,902,280
Additional capability in F.Y. 1974.....	1,000,000

Authorization: P.L. 86-488, June 3, 1960

Status and Capability:

The San Luis Water District has an authorized P.L. 130 Loan. In order to serve the distribution system upon completion several pumping plants along the San Luis Canal are required. The F.Y. 1974 budget contains $150,000 for preconstruction and design of specifications for constructing the pumping and relift facilities. There is an additional capability on this feature of $1,000,000. These additional funds would be used to award the two contracts required. With these additional funds the relift facilities would be completed in F.Y. 1976. Additional funds will permit issuance of specifications in January 1974 with award scheduled for March 1974.

This capability statement is closely related to the capability of the San Luis Water District loan capability and the two should be considered jointly. The additional capability on the loan is $1,700,000 in addition to the $1,370,000 FY 1974 program in the budget.

Location and Description:

The several pumping plants along the San Luis Canal covered in this statement are to serve the San Luis Water District. The San Luis Water District is located on the western side of the San Joaquin Valley in Merced and Fresno Counties, California, 3 miles northeast of Los Banos. The District embraces about 58,000 acres. The new distribution system to be constructed by loan funds will serve approximately 15,600 acres. Deliveries of 128,000 acre-feet of water annually will be taken from the San Luis Canal and the Delta-Mendota Canal.

Columbia Basin Project, Wash.

Senator Bible. The budget request for this project is $30,023,000. Local interests have asked for an additional $500,000. What is your capability for additional deferred and supplemental construction for wasteways to serve irrigation block 81? What is your capability for this item of the Columbia Basin project?

Mr. Keating. Mr. Chairman, we do not have a capability on this item for fiscal year 1974. The need for the wasteway facilities of block 81 and possible alternatives is under study. These studies and followup meetings with the Quincy-Columbia Basin Irrigation District will take most of fiscal year 1974 and any construction would be proposed after 1974.

Grand Coulee Third Powerlpant

Senator Bible. Explain why the House committee added $5 million for the third powerplant and the need for an additional $4 million for acceleration.

Mr. Keating. The $5 million is needed for payments to the construction contractor in settlement of its claims of additional costs due to difficulties in performing the work.

In regard to the $4 million for acceleration and in order to expedite the on-line dates of the first three units of the third powerplant, we will expend about $4 million to accelerate construction. This is based upon purchasing necessary additional materials and full labor escalation for about 2 months during good construction weather. The online dates may be improved by 4 to 7 months.

Columbia Basin Project, Wash. (Bacon Siphon and Tunnel No. 2)

Senator Bible. In fiscal year 1972 Congress appropriated $1,055,000 to initiate construction of the Bacon Siphon and Tunnel No. 2, and these funds are not proposed for use until after 1974. Local interests have expressed concern about the progress of work on this feature. Would you comment on its status?

Mr. Keating. Mr. Chairman, the second Bacon Tunnel and Siphon is the key to the development of the last half of the Columbia Basin project, which will ultimately open nearly 500,000 additional acres to irrigated agriculture. The cost of the tunnel and siphon is, itself, significant and the cost of total system will approach $800 million. It is our opinion that a commitment of this magnitude for new irrigation should be deferred for the time being.

Colville Indian—Rehabilitate Indian Lands

Senator Bible. The Colville Confederated Tribes have asked that $1,000,000 per year, over a 5-year period, be made available to rehabilitate Indian lands of the Chief Joseph Dam and Columbia Basin projects. What is your capability on these projects?

Mr. Keating. The legislation authorizing the Chief Joseph Dam project did not include authority for the Bureau to assist the Colville Confederated Tribes in rehabilitating their lands located within the project area. In the Secretary's feasibility report of January 7, 1954

(House Document 374, 83d Congress), which was used in support of that legislation, it is stated ". . . The proposed report is hereby modified to eliminate from the plan the Indian lands in the several divisions recommended for authorization. . . ." These lands were eliminated from the project because of a lack of landowner interest.

Legislation (P.L. 74–409) authorizing construction of Grand Coulee Dam provides for the storage and delivery of the stored water for the reclamation of public lands and Indian reservations. Studies involving Indian developments associated with the Grand Coulee Dam could thus be undertaken within the authorities of the present Columbia Basin project.

REQUEST FOR TECHNICAL AND FINANCIAL ASSISTANCE

At the appropriation hearings in May 1973, Mr. Mel Tonasket, chairman of the Colville Confederated Tribes, appeared before the Senate Subcommittee for Water and Power with regard to the urgent need for improving economic conditions of the tribes.

Construction of Grand Coulee and Chief Joseph Dams on the Columbia River and the resultant adverse effect on the salmon fishery are considered to have contributed significantly to the economic plight of the Indians. He cited the lack of job opportunities and high level of unemployment as the cause of many Indians having to leave the reservation.

On the positive side, Mr. Tonasket advised of the great potential that exists for development of water and related Indian land resources. Such development would provide irrigation, recreation, fish and wildlife enhancement, municipal water supplies, et cetera.

In behalf of the tribes, Mr. Tonasket has requested that $1,000,000 per year, over a 5-year period, be made available through the Bureau's program to rehabilitate Indian lands of the Chief Joseph Dam and Columbia Basin projects. He further indicated that existing legislation provides for such development.

CROOKED RIVER PROJECT, OCHOCO DIVISION, OREG.

Senator BIBLE. There is no appropriation request but local interests have asked for $40,000. What is your capability on the Ochoco Division?

Mr. KEATING. Mr. Chairman, a comprehensive review of the policies relating to the Bureau-wide rehabilitation and betterment program is currently underway which could possibly result in recommendations on new policy and associated legislative modifications. We would not recommend a start on this new rehabilitation and betterment program on the Ochoco Division until the review is completed.

Senator BIBLE. Submit a statement on this project for the record.

Mr. KEATING. Yes sir.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost	$596,000
Allocation to date, including FY 1973	--
Budget Request, FY 1974	--
Balance to complete after FY 1974	596,000

Authorization: P.L. 335, October 7, 1944 and
P.L. 451, March 3, 1950.

Status and Capability:

Crooked River Project is presently being operated and maintained by the Ochoco Irrigation District. No money is included in the FY 1974 budget request for rehabilitation work on this project.

Location and Description:

The Crooked River Project Ochoco Irrigation District is located in Crook County near the town of Prineville in central Oregon. Project works include Ochoco and Prineville dams, several pumping plants, canals, a lateral distribution system and drainage facilities serving about 19,000 acres of irrigable land. The irrigation facilities were designed and constructed for gravity application. However, in recent years the Irrigation District has been installing low head concrete pipe in the laterals to eliminate open ditches. Approximately 60 percent of the District lands are presently served by irrigation sprinkler systems which have been installed by individual landowners. In an effort to further improve operations, obtain more efficient use of water, reduce seepage, update their lateral and drainage system and reduce maintenance costs, Ochoco Irrigation District proposes to replace all remaining open laterals with concrete pipe, place two open wasteway channels in pipe, riprap one wasteway channel and enclose certain existing open drains with concrete pipe.

KLAMATH PROJECT, SHASTA VIEW IRRIGATION DISTRICT, CALIF.

Senator BIBLE. The budget request for this project is $1,000,000 while local interests have requested $2,500,000. What is your capability?

Mr. KEATING. Our capability of $2,500,000 agrees with the local supporters which is an increase of $1,500,000 above the appropriation request.

Senator BIBLE. What would be accomplished with the additional $1,500,000?

Mr. KEATING. These additional funds would allow the district to complete most of the repair of the distribution system during the nonirrigating season in fiscal year 1974. Since the bulk of the construction involves installation of pipeline which does not lend itself to staged construction, the district desires to complete construction in one season. We agree that it is advantageous to complete this work as soon as possible.

LOWER RIO GRANDE, MERCEDES DIVISION, TEX.

Senator BIBLE. There is no appropriation request but local interests have requested $200,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this project is $200,000. These funds would permit purchase and start of the installation of water metering facilities. This work is the final item to be accomplished in the rehabilitation of these facilities.

Senator BIBLE. Would you submit a statement on this project for the record?

Mr. KEATING. Yes, sir.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost	$11,777,657
Allocation to date, including F.Y. 1973	10,781,657
Budget Request, F.Y. 1974	-0-
Balance to complete after F.Y. 1974	996,000
Additional Capability in F.Y. 1974	200,000

Authorization: P.L. 85-370, April 7, 1958
P.L. 86-765, September 13, 1960

Status and Capability:

Major rehabilitation of the existing facilities has been completed. The District now plans on the installation of water metering facilities and supplemental rehabilitation of the river pumping plant. An amendatory repayment contract for an additional $1,000,000 will be executed to increase the repayment ceiling from $10,800,000 to $11,800,000.

The F.Y. 1974 budget request does not include any funds for this project. The amount of $200,000 could be effectively utilized in F.Y. 1974 to purchase and start installation of the meters.

Location and Description:

The project is located in the Lower Rio Grande Valley in Hidalgo and Cameron Counties, Texas, and provides full service to 68,000 acres of irrigable land. The plan provides for rehabilitation of the existing diversion, distribution, and drainage systems to permit more efficient operation and maintenance of the District's facilities, reduce seepage losses, and provide drainage relief. Rehabilitation is complete except for metering facilities and supplemental rehabilitation of the river pumping plant.

Orland Project, East Park Reservoir, Calif.

Senator Bible. There is no appropriation request for recreation development on the Orland project; but local interests have asked for $65,000 for development of recreation facilities at East Park Reservoir. Do you have a capability on this work?

Mr. Keating. Mr. Chairman, our review indicates that there are three conceivable vehicles for providing and administering recreation facilities at the Orland existing project reservoirs:

1. Minimum basic facilities may be provided by the Bureau of Reclamation provided they are required for public health and safety. However, costs would be reimbursable by the project. In this case, the Orland Users Association would be required to repay the costs. They are not interested in this approach.

2. A more practical vehicle for providing recreational development would be Public Law 89–72 whereby the Federal Government would match a non-Federal contribution of $100,000 provided a contractual arrangement was reached. Efforts to stimulate non-Federal interest have been fruitless.

3. In the absence of interest in either of the above, authorization would be necessary before the Bureau could develop and manage a nonreimbursable recreational development at East Park Reservoir. This could be in the form of specific authorizing legislation or possibly through the addition of language in the appropriation bill. If the latter method is selected, we would suggest the following language:

Provided further, That of the amount herein appropriated not to exceed $65,000 shall be used for operation, maintenance and improvement of recreation facilities at East Park Reservoir, Orland Project, California, which shall be nonreimbursable.

Garrison Diversion Unit, Pick-Sloan Missouri Basin Program, N. Dak.

Senator Bible. The budget request for this project is $16,580,000 and local interests support this request. However, they express a concern that several contracts proposed for award in the fiscal year 1973 appropriation will not be awarded and now only one of these is scheduled for award in fiscal year 1974. Would you respond to this?

Mr. Keating. Yes, sir. In the fiscal year 1973 appropriations, funds were provided to award contracts for additional reaches of the McClusky Canal, Lonetree Dam and highway relocation, Wintering Dam, James River dike, Oakes pumping plant and Westside Canal irrigation facilities. Because of the budgetary limitations it was necessary to limit the award of contracts to the McClusky Canal sections and to the Lonetree highway relocation.

Senator Bible. The local interests further ask that the Bureau award the contracts for all remaining features of the supply works in fiscal year 1974 within your budget request of $16,580,000. Can you do this?

Mr. Keating. It would be physically possible to start all of the requested contracts in fiscal year 1974 by delaying the award until late in the fiscal year and thus limiting 1974 funding on each to minimal amounts. The problem concerns future fiscal year funding. These contracts would create heavy earnings in 1975 which would be a problem assuming current budgetary conditions continue into the next fiscal

year. We could, however, improve the 1974 accomplishment somewhat if an additional $1,200,000 could be provided. With this amount we would be able to advance the awards for reaches 4A and 3B of McClusky Canal from late in fiscal year 1974 to early in fiscal year 1974, and complete this facility in December 1976, 7 months earlier. This change would not create a problem in fiscal year 1975.

GARRISON DIVERSION UNIT, N. DAK. (BRIDGE R2–OA, MCCLUSKY CANAL)

Senator BIBLE. The fiscal year 1974 budget for the Garrison Diversion Unit does not provide funds to construct the R2–OA crossing over the McClusky Canal near Turtle Lake. Both Senators Burdick and Young have requested that funds be specifically appropriated for this purpose.

Mr. KEATING. Of the 12 McClusky Canal crossings requested by McLean County, 11 have been approved for construction and one, bridge R2–OA, estimated to cost nearly one-half million dollars, could not be justified because of its high cost and low anticipated use. Another bridge about 1 mile from the R2–OA location is being built at a cost of $150,000. Not building bridge R2–OA will affect only five families on two farmsteads by increasing the travel distance an additional 2 miles in going to Turtle Lake. The farming operations of two farmers will be affected by imposing additional travel distances of 2 and 4 miles to get to their respective lands on the other side of the canal. Compensation to the landowners for inconvenience is not allowed unless the farm unit is severed by the canal rights-of-way. The decision not to approve construction of bridge R2–OA was reached only after extensive and detailed cost analysis and use studies.

NARROWS UNIT, COLO.

Senator BIBLE. There is no appropriation request but local interests have asked for $1,500,000. What is your capability on the Narrows Unit?

Mr. KEATING. Mr. Chairman, the next logical activity on the Narrows Unit involves significant sums for land acquisition and water rights. Our estimate of first year requirement for this purpose is $750,000, and the second year requirement is $8,300,000. Any lesser amount would have a defeating purpose of forcing land escalation far beyond the norm. Recognizing that any program increases should be balanced by offsetting reductions elsewhere, we would prefer postponing this first year program until the overall budget picture is more favorable for this development.

Senator BIBLE. Please submit a fact sheet or statement or this project.

[The statement follows:]

Narrows Unit - Colorado

Fact Sheet

Location: Northeastern Colorado along the South Platte River.

Description: The Unit will provide supplemental irrigation water to two conservancy districts (287,000 acres), flood control, recreation enhancement, highway improvement, and potential future municipal and industrial water supplies.

Crops produced: Sugar beets, dry beans, alfalfa, and corn.

Authorized: August 28, 1970, P.L. 91-389

Project Cost Estimate:

At authorization: (based on January 1969)	$68,050,000
Current (based on October 1972 prices)	$89,750,000

B/C ratios: Direct - - - 1.36 to 1
Total - - - 1.42 to 1

Estimated Annual Benefits at Completion: Irrigation, $1,632,000; Flood control, $961,000; Recreation, $790,000; F&WL, $293,000; Total, $3,675,000.

Repayment:

Irrigation:	$26,199,400
Recreation & F&WL:	$ 1,798,600
Nonreimbursable:	$33,876,400
Total	$61,874,400

Repayment Organizations: Lower South Platte Water Conservancy District and the Central Colorado Water Conservancy District.

Allotments to date	$2,176,754 1/
Financing provided to date by project supporters	30,000
FY 74 Budget Request	
Committee Recommendation for FY 74	

1/ Includes $1,726,954 from General Investigations Funds

Status: An estimated $280,000 would be required to complete advance planning. The next logical activity on the Narrows Unit involves significant sums for land acquisition and water rights. Our estimate of first year requirement for this purpose is $750,000, and the second year requirement is $8,300,000. Any lessor amount would have a defeating purpose of forcing land escalation far beyond the norm. Recognizing that any program increases should be balanced by offsetting reductions elsewhere, we would prefer postponing this first year program until the overall budget picture is more favorable for this development.

Environmental Impact Statement: Filed with the Council on Environmental Quality June 9, 1970.

NEBRASKA MIDSTATE DIVISION, NEBR. (ADVANCE PLANNING)

Senator BIBLE. A representative of the National Audubon Society has presented testimony in opposition to the Nebraska midstate division project. Have you examined their statement and would you care to comment on it?

Mr. KEATING. Yes, sir. During hearings to consider authorization of the Midstate Division in 1967, we advised the Congress that preconstruction planning studies would be required to determine the final location, size, and cost of major facilities. These investigations are now in progress and are scheduled for completion in 1976. The objective of our studies is to appraise the authorized purposes of the division in terms of today's needs.

While we share the National Audubon Society's concern for the environment, we note that today's Platte River is largely a product of man's development. Prior to construction of upstream reservoirs, the Platte experienced extremes in riverflows. We are in the process of negotiating contracts for independent environmental studies by educational institutions or private consultants. Based largely on these environmental studies, an environmental impact statement would be prepared in compliance with the National Environmental Policy Act of 1969. All environmental impacts will be evaluated as our planning studies progress. Our environmental studies will be done concurrently with the advance planning activities and are also scheduled for completion in 1976.

NORTH LOUP UNIT, NEBR. (ADVANCE PLANNING)

Senator BIBLE. There is no appropriation request but local interests have requested $200,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this project is $200,000. This could be used to initiate advance planning. Lands would be reassessed and land classification certified, economic and repayment analyses updated, and preconstruction surveys and designs initiated. Negotiations would also begin on repayment.

Senator BIBLE. Since this project does not appear in the 1974 budget, would you submit a factsheet for the record?

Mr. KEATING. Yes, sir.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost	$ 79,500,000
Allocation to date, including FY 1973	-0-
Budget Request FY 1974	-0-
Balance to Complete after FY 1974	79,500,000
Additional Capability in FY 1974	200,000

Authorization: P.L. 92-514, October 20, 1972

Status and Capability:

The final environmental impact statement was filed September 18, 1972.

An additional $200,000 could be used in FY 1974 to initiate advance planning. Lands would be reassessed and land classification certified, economic and repayment analyses updated, and preconstruction surveys and designs initiated. Preliminary discussions would be held with potential contracting entities on repayment and operating arrangements.

Location and Description:

The project is located in central Nebraska on the North Loup River in Valley, Greeley, Howard, Nance, Merrick, Loup and Garfield counties. It will provide a full irrigation water supply for 52,570 acres of high-quality lands. The project will also provide recreation and fish and wildlife benefits.

The Twin Loups Reclamation District has collected local taxes for 18 years in support of this development. It and the Twin Loups Irrigation District are willing to negotiate repayment contracts. Groundwater levels are declining so that some irrigators are being hard-pressed to maintain their activities, as are dryland farmers. Young people are leaving the area for lack of job opportunities. This development would generate $36 million annually in new business activities for Nebraska.

The benefit-cost ratio for this project is 1.23 to 1. The average annual benefits of $3,871,000 are broken down as follows:

Irrigation	$ 3,804,800
Recreation	37,500
Fish and Wildlife	28,700
Total	$ 3,871,000

OAHE UNIT, PICK-SLOAN MISSOURI RIVER PROGRAM, S. DAK.

Senator BIBLE. The budget request for this project is $1,500,000 while local interests have requested $2,500,000. What is your capability?

Mr. KEATING. Our capability is $2,500,000, the same as the amount requested by local interests. This is an increase of $1 million above the appropriation request.

Senator BIBLE. What would be accomplished with the additional $1 million?

Mr. KEATING. The additional funds would be used to speed up the awards for the Oahe pumping plant from May to February 1974, and pumps and motors from April 1974 to December 1973.

O'NEILL UNIT, NEBR. (ADVANCE PLANNING)

Senator BIBLE. There is no appropriation request but local interests have requested advance planning funds for this project. What is your capability on the O'Neill unit?

Mr. KEATING. Mr. Chairman, our capability on this project is $200,000. It would be used to initiate advance planning studies including detailed topographic and agricultural surveys, additional geologic explorations, updating of hydrologic studies, and economic and repayment analyses. Preliminary discussions would be held with potential contracting entities on repayment and operating arrangements.

Senator BIBLE. Would you submit a statement for the record that would provide the principal fact on this project?

Mr. KEATING. Yes, sir.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost	$113,300,000
Allocation to date including FY 1973	-0-
Budget Request FY 1974	-0-
Balance to Complete after FY 1974	113,300,000
Additional Capability in FY 1974	200,000

Authorization: P.L. 92-514, October 20, 1972

Status and Capability:

About four years of advance planning work will be required. The final environmental impact statement was filed September 29, 1972.

An additional $200,000 could be used in FY 1974 to initiate advance planning studies including detailed topographic and agricultural surveys, additional geologic explorations, updating of hydrologic studies and economic and repayment analyses. Preliminary discussions would be held with potential contracting entities on repayment and operating arrangements.

Location and Description:

The project is located in northcentral Nebraska within the Niobrara River Basin in Brown, Cherry, Keya Paha, and Holt Counties and will provide full irrigation water for 77,000 acres of land. The project will also provide flood control, recreation and fish and wildlife benefits.

The Northcentral Nebraska Reclamation District has collected local taxes for six years. The Niobrara Basin Irrigation District was formed in 1972. The project is needed immediately to stabilize the economy, stem the trend to large corporate farms now taking place in the area, and prevent further lowering of the area's groundwater levels (declining at a rate of 1 to 2 feet per year in the areas of intensive irrigation well development.) Estimated impact on Nebraska's economy is approximately $67.5 million annually.

The benefit-cost ratio for this project is 1.42 to 1. The average annual benefits of $6,626,000 are broken down as follows:

Irrigation	$ 6,158,000
Recreation	381,000
Fish and Wildlife	71,000
Flood Control	16,000
Total	$ 6,626,000

PROGRESS OF NEGOTIATIONS WITH PRIVATE UTILITIES ON YELLOWTAIL-WYODAK 230–KV TRANSMISSION LINE, MONT.

Senator BIBLE. Mr. Keating, several outside witnesses recommended reducing the Yellowtail-Wyodak 230-kv transmission line program of $3,480,000 as proposed in the President's budget. The reduction was requested because of delays in negotiations with power companies. Would you comment on the progress of your negotiations with the power companies and also state what amount you feel is necessary to continue those negotiations?

Mr. KEATING. Progress has been slow during a prolonged negotiation period and there has already been a full year's slippage in construction schedules without general agreement on joint public-private use plan. Non-Federal principals in negotiations are Basin Electric Power Cooperative, Black Hills Power and Light Company and Pacific Power and Light Company. The Bureau has served notice that load commitments are becoming critical and has established the target date of August 1, 1973, for participants to complete joint planning arrangements.

The budget request for fiscal year 1974 of $3,480,000 is no longer realistic and we recommend that it be reduced to $650,000. This will provide for acquisition of right-of-way and for award of construction contracts late in fiscal year 1974.

WATERTOWN-SIOUX CITY-MOVILLE 345 KV TRANSMISSION LINE AND WATERTOWN CONTROL CENTER, TRANSMISSION DIVISION, PICK-SLOAN MISSOURI BASIN PROGRAM, S. DAK.

Senator BIBLE. There is no appropriation request for these transmission system facilities. Local interests have requested $1,500,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this project is $1,500,000. Of this amount, $1,200,000 would be used to purchase right-of-way, make the award of a construction contract for the transmission line and terminal facilities, and for initial contract earnings. The remaining $300,000 would be used to initiate construction for the new Power System Operations Office building and for procurement of a load frequency control computer.

Senator BIBLE. Since these facilities were not covered in the 1974 budget, would you submit a statement for the record?

Mr. KEATING. Yes, sir.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost	$ 34,400,000
Allocation to date, including F.Y. 1973	300,000
Budget Request, F.Y. 1974	-0-
Balance to Complete after F.Y. 1974	31,400,000
Additional Capability in F.Y. 1974	1,500,000

Authorization: P.L. 78-534, December 22, 1944: P.L. 79-732, August 14, 1946

Status and Capability:

An additional $1,500,000 could be used in FY 1974 for initiation of construction on (1) Watertown-Sioux City-Moville 345 kv transmission line, and (2) new facilities for Power System Operations Office at Watertown. These two items, currently in the active planning stage, are scheduled for construction beyond the budget year. The Bureau has the capability and operational need to expedite construction on these facilities to bring Federal system up to current reliability standards for interconnected operation. The $1,500,000 would be used to purchase right-of-way, and award construction contracts for the transmission line and terminal facilities, and for the power system operations office. Collection of field data and the preparation of designs and specifications will proceed.

Location and Description:

The Federal transmission system cannot withstand a single contingency outage without detrimental effects to its customer, interconnected power suppliers and internally. This has been of considerable concern and the construction of this additional line would take care of the situation.

The Watertown-Sioux City-Moville 345-kv line and terminal facilities is a part of the transmission facilities of the Pick-Sloan Missouri Basin Program which consists of a system to interconnect and coordinate the operation of Bureau of Reclamation and Corps of Engineers hydroelectric powerplants in the basin and to deliver power for irrigation pumping, sales to municipalities, cooperatives, private utilities, and other wholesale customers.

The 200 mile Watertown-Sioux City-Moville 345-kv transmission line and terminal facilities will begin at Watertown, South Dakota, and extend to Moville, Iowa, going through Sioux City, Iowa. This $31.7 million line will provide the support required for system stability and greatly improve reliability by closing a 345-kv loop. The loop begins at Watertown, South Dakota, and swings south to Grand Island, Nebraska, then goes east to Omaha and then up to Moville, Iowa, with the proposed line tieing in the loop.

The Power System Operations Office at Watertown, South Dakota, is the nerve center for the entire Pick-Sloan Missouri Basin Program -- Eastern Division Power System. The Power System Operations Office and Area Dispatcher are presently located in two buildings at the Watertown substation. The Power System Operations Office will be relocated in the new building along with the programmable master controller supervisory equipment (provided under the O&M program) and the computer. This expansion will then provide adequate space for the Area Dispatcher Operation which would operate in the two older but modernized buildings.

RECREATION FACILITIES AT EXISTING RESERVOIRS—VARIOUS STATES

Senator BIBLE. The budget request for this project is $572,000 while local interests have requested an increase of $100,000 to cover work on Owyhee Reservoir in Oregon. What is your capability?

Mr. KEATING. We have a capability of $50,000 on this reservoir, sir.

Senator BIBLE. What would be accomplished within your additional $50,000 and the local interest request of $100,000?

Mr. KEATING. The additional capability would be utilized to prepare and construct recreation facilities on the reservoir. The development of outdoor recreation facilities at the Owyhee Reservoir has not keep pace with demands that have exceeded all expectations where use is now in excess of 181,000 visitor days per year and rapidly increasing. The request by the local interests would require a more aggressive program than we now find possible of achievement.

SOLANO PROJECT, CALIF.

Senator BIBLE. There is no appropriation request but local interests have asked for $200,000. What is your capability on the Solano project?

Mr. KEATING. Mr. Chairman, as indicated earlier a comprehensive review of the policies of the Bureau-wide rehabilitation and betterment program is currently underway which could possibly result in recommendations on associated legislative modifications. We would not recommend a start on this new rehabilitation and betterment program on the Solano project until the review is completed.

TETON BASIN PROJECT, LOWER TETON DIVISION, IDAHO

Senator BIBLE. The budget request for this project is $13,045,000 while local interests have requested $13,545,000. What is your capability?

Mr. KEATING. Our capability is $13,545,000 which is an increase of $500,000 above the appropriation request.

Senator BIBLE. What would be accomplished with the additional $500,000?

Mr. KEATING. These additional funds would be used to initiate construction of the irrigation canals with $200,000 and the fish and wildlife facilities with $300,000. Construction needs to be started on the irrigation canals so that water supplies can be utilized as soon as they are available. Teton Reservoir will adversely affect the fish and wildlife of the area by inundating about 17 miles of trout stream and some big game winter range. Final agreement has been reached with the Fish and Wildlife Service and the Idaho Fish and Game Department on a mitigation. With Teton Reservoir scheduled to be in operation in the spring of 1976, it is essential that implementation of that plan be started as soon as possible.

Tualatin Project, Oreg.

Senator Bible. The budget request for this project is $7,585,000 while local interests have requested $7,785,000.

Mr. Keating. Our capability of $7,785,000 agrees with the request of the local interests and it is $200,000 over the budget request.

Senator Bible. What would be accomplished with the increase of $200,000 above the appropriation request?

Mr. Keating. The additional $200,000 would be used to initiate construction of recreation facilities at Scoggins Reservoir. Because of the close proximity to the Portland Metropolitan complex, the reservoir, is expected to receive heavy recreational use. Scoggins Dam is scheduled to be in operation in 1975, therefore, construction of recreation facilities should start in fiscal year 1974 to be available for use by the public in 1975.

Upper Snake River Project, Salmon Falls Division, Idaho (Advance Planning)

Senator Bible. There is no appropriation request but Senator Church and Senator McClure have asked for $100,000. What is your capability on the Salmon Falls Division?

Mr. Keating. Mr. Chairman, we do not have a capability on this project. The President has developed the fiscal year 1974 Federal Budget with the objective of avoiding tax increases and inflation. Meeting this objective within the constraints has required us to carefully evaluate our programs of meeting critical short-term needs. We were not able to include advance planning for Salmon Falls as well as for a number of other projects that are eligible for advance planning activities.

Senator Bible. Would you submit a statement for the record?

Mr. Keating. Yes, sir.

[The statement follows:]

Summarized Financial Data:

Total estimated Federal cost	$57,055,815
Allocation to date, including FY 1973	-0-
Budget Request, FY 1974	-0-
Balance to complete after FY 1974	57,055,815

Authorization: P.L. 92-514, October 20, 1972

Status:

Advance planning on this project has not been started.

Location and Description:

The Salmon Falls Division, Upper Snake River Project is located south of the Snake River in Twin Falls County, Idaho, near the city of Twin Falls.

The ground water in the Milner-Cottonwood Unit is steadily declining to the point many irrigators have had to deepen their wells to get an adequate water supply and other wells have been abandoned. The Idaho Department of Water Administration has declared this a critical ground water area which prohibits further ground water development.

New wildlife habitat is needed in the Salmon Falls area to meet increasing hunting pressure from the Twin Falls-Burley population centers and to replace existing habitat which is being climinated by suburban developments and intensive farming practices. Construction of the Salmon Falls Division would significantly increase upland game and waterfowl populations and resulting hunting opportunities.

The features would include Milner Pumping Plant on the Snake River above the existing Milner Dam, the 47-mile-long Milner-Salmon Falls Canal, Hollister Relift Pumping Plant, ground water wells, and irrigation distribution and drainage systems. Water would be pumped from the Snake River and conveyed in the Milner-Salmon Falls Canal to provide supplemental irrigation service to about 49,400 acres and full irrigation service to 14,700 acres in the Salmon Tract and Milner-Cottonwood Units. The development would also include full use of Salmon Creek water for irrigation of the Salmon Tract Unit and use of ground water supplies in the Milner-Cottonwood Unit. Ground water would be pumped on the Snake River Plain north of the Snake River as replacement and exchange for water pumped from the Snake River to the Salmon Falls Division during dry periods when Snake River water was not spilling past Milner Dam.

Upper Colorado River Storage Project

Animas-La Plata Project, Colo.-N. Mex.

ADVANCE PLANNING

Senator Bible. There is no appropriation request but local interests have requested $400,000. What is your capability on this project?

Mr. Keating. Mr. Chairman, our capability on this project is $375,000. These funds would permit completion of engineering and land classification surveys, water supply studies, geology and exploration, and the continuation of economic studies and plans and estimates. The local interests requested $400,000 which is a somewhat more aggressive program than we feel is warranted.

Senator BIBLE. Would you submit a data sheet on this project for the record?

Mr. KEATING. Yes, sir.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost	$114,082,000
Allocation to date including F.Y. 1974	609,695
Budget Request, F.Y. 1974	-0-
Balance to Complete After F.Y. 1974	113,472,305
Additional Capability in F.Y. 1974	375,000

Authorization: P.L. 90-537, September 30, 1968

Status and Capability:

The F.Y. 1974 budget contains $500,000 to provide for review of the effects of authorized projects not yet under construction on the increasing salinity of the Colorado River. The Animas-La Plata Project is one of these projects.

Advance planning studies are well underway. An additional $375,000 could be used in F.Y. 1974 for the completion of engineering and land classification surveys, water supply studies, geology and exploration, and the continuation of economic studies and plans and estimates.

Location and Description:

The project is located in Montezuma and La Plata Counties of southwestern Colorado and in San Juan County of northwestern New Mexico. This is a multipurpose project which will provide 76,200 acre-feet annually of municipal and industrial water supplies and fish and wildlife and recreation benefits. It will also provide directly a full water supply for the irrigation of 46,520 acres and a supplemental supply for 25,600 acres. By exchange, it will also supply 3,700 acre-feet for a full irrigation supply to 1,110 acres and for a partial supply to 20,620 acres of Florida Project lands. A total of 76,600 acre-feet of project water supplies are allocated for Indian development, 53,500 acre-feet for municipal and industrial development (namely, energy or power production from coal resources) and 23,100 acre-feet for irrigation 7,520 acres of reservation lands in Colorado and New Mexico.

The benefit-cost ratio for this project is 1.59 to 1. The average annual benefits of $7,600,000 are broken down as follows:

Irrigation	$5,541,000
Municipal and Industrial Water	1,840,000
Fish and Wildlife	52,000
Recreation	132,000
Area Redevelopment	35,000
Total	$7,600,000

CENTRAL UTAH PROJECT, BONNEVILLE UNIT, UTAH

Senator BIBLE. The budget request for this project is $6,280,000 while local interests have requested $20 million. What is your capability?

Mr. KEATING. Our capability is $11,080,000, an increase of $4,800,000 above the appropriation request.

Senator BIBLE. What would be accomplished with the additional $4,800,000 and could you tell us what the local interests have included in their total that is not in your capability?

Mr. KEATING. The $4,800,000 would be used on the improvement of Rock Creek Road and for acquirement of right-of-way for the Jordanelle Dam. Improvement of Rock Creek Road will allow preconstruction activity to proceed for the Upper and Lower Stillwater Reservoir and Stillwater Tunnel. The existing road is extremely rough and treacherous at times. The improved road will also benefit other area users. Land values in the Jordanelle area are escalating. Purchase in fiscal year 1974 should permit substantial savings.

The local interests request of $20,000,000 would require a more aggressive construction program than we now find possible of achievement.

CENTRAL UTAH PROJECT, JENSEN UNIT, UTAH

Senator BIBLE. There is no appropriation request but local interests have asked for $1,000,000. What is your capability on the Jensen Unit?

Mr. KEATING. Mr. Chairman, we have no additional capability on the Jensen Unit at this time. This unit was initially proposed as a construction start in fiscal year 1971 and funds were appropriated. However, we have not completed the necessary repayment contract arrangements with the Uintah Water Conservancy District.

Senator BIBLE. Supply for the record a fact sheet for this project.

Mr. KEATING. Yes, sir.

[The information follows:]

Summarized Financial Data:

Total Estimated Federal Cost	$15,514,000
Allocation to date, including F.Y. 1973	1,847,529
Budget Request, F.Y. 1974	-0-
Balance to Complete after F.Y. 1974	13,666,471

Authorization: P.L. 84-485, April 11, 1956

Status:

Work on updating the Definite Plan Report, Repayment Contract, Environmental Statement, and collection of design data is underway.

Location and Description:

The project is located in Uintah County in Eastern Utah near the town of Jensen on the Green River and Brush Creek. Primary benefits from this multipurpose project would be obtained from furnishing 10,800 acre-feet of municipal water and 7,200 acre-feet of industrial water. A supplemental water supply would be provided for 3,640 acres and a full supply for 440 acres of land along with fish and wildlife, recreation and flood control benefits. Crude oil wells exist nearby and the area is a tourist center for Dinosaur National Monument.

The unit area is included within the Four Corners Economic Development Region--a depressed area.

The benefit-cost ratio for this project is 1.8 to 1. The average annual benefits of $1,173,600 are broken down as follows:

M&I	$ 949,000
Irrigation	168,000
Fish and Wildlife	16,600
Recreation	13,200
Flood Control	19,800
Area Redevelopment	7,000
Total	$1,173,600

Central Utah Project, Utah

Senator Bible. Mr. David C. Raskin, conservation chairman of the Uinta chapter of the Sierra Club appeared in opposition to the various units of the Central Utah project. Have you reviewed his statement and would you care to comment on it?

Mr. Keating. Yes, sir. However, I believe it would be better if I furnished the response for the Sierra Club's comments as an insert, if I may, since it is quite involved.

Senator Bible. Please do so.

[The information follows:]

PART I

a. Project Costs

The Bonneville Unit of the Central Utah Project was analyzed in accordance with the established guidelines and rules in effect at that time. In accordance with Reclamation Law, irrigators pay up to their ability; the balance of the irrigation costs are repaid from other project revenues. The National Water Commission Report has not been approved or adopted for use.

b. Surplus Crops

As far as surplus crops are concerned, the latest information available to us indicates that for the foreseeable future, substantially increased farm production will be needed to meet immediate national and international needs. Most of the projects irrigation water supply supplements present irrigation. This is consistent with the current programs of firming the rural economy. In view of this, it would seem short sighted to stop construction of this unit.

c. Salinity of Colorado River

Under the Colorado River Compact, the Upper Basin States were authorized to develop their entitlement to the river by guaranteeing delivery of a specified amount of water to the Lower Basin States. Increases in salinity of the Colorado River with these additional water developments were recognized by Congress and Reclamation was given the statutory responsibility to study all possible means of improving the quality and alleviating the ill effects of water of poor quality in the Colorado River basin.

The Bureau of Reclamation published a report in 1972, entitled "Colorado River Water Quality Improvement Program." This report states,

> "Prior to their authorization, it was known that the Colorado River Storage and participating projects, Navajo Indian Irrigation Project, San Juan-Chama Project, and the Fryingpan-Arkansas Project would cause significant increases in salinity levels. This was expected to arise primarily from the increased consumptive use of water and transport of high quality water out of the basin. Recognizing the concern of the Colorado River water users, Congress stipulated that studies be made of the water quality in the basin and that control plans be developed. The stipulation was expressed in the authorizing legislation for the projects."

A salinity control study for the entire Colorado River Basin is in progress. Basically, this study is designed to investigate ways to reduce the salt load in the lower portion of the river to offset the affects of the upstream depletion associated with authorized developments and to determine if such salinity reduction measures are economically feasible. A basic network of water quality stations has been established at principal points throughout the entire basin to facilitate the study and to help

identify high saline sources that might be intercepted, and removed from the river system.

The Bonneville Unit impact on water quality of the Colorado River would be to increase the average concentration of dissolved solids below Hoover Dam about 10 mg/l to 14 mg/l as estimated by the Bureau of Reclamation and the Environmental Protection Agency, respectively. Historically, the average annual salinity concentration of the Colorado River below Hoover Dam has varied from a low of 610 mg/l in 1949 to a high of 839 mg/l in 1956. Based upon present modified conditions, the average salinity below Hoover Dam is estimated to be 745 mg/l.

The anticipated salinity increase due to future developments will range from 171 mg/l to 226 mg/l which would increase the average concentration from 745 mg/l to the 916-to 971 - mg/l range by the year 2000. The amount of increase attributable to the Bonneville Unit would be 10 to 14 mg/l or about 4 percent of the total estimated increase. Thus, the Bonneville Unit, separately, would have only a minor effect on the salinity increase. However, its contribution to a serious and cumulative problem is recognized.

PART II

The Bureau of Reclamation recognizes that there are significant environmental impacts associated with the project as well as benefits derived from its development. We are very concerned about the impacts upon the environment and are actively trying to improve both new and ongoing unit plans.

a. Stream Fishery Losses

The August 1970 draft of the Utah Fishing Water Inventory and Classification, published by the Utah State Department of Natural Resources, reported that there are presently about 5,377 miles of stream in the State, of which 3,268 miles are classified as trout habitat. Within the scope of the Bonneville Unit, there are roughly 175 streams stretching about 1,600 miles that qualify as trout habitat. Approximately 1,200 miles of these streams are in the Bonneville Basin with the rest being located in the Uinta Basin. About 40 miles of stream are located in United States forests. Besides documenting the quantity of fishing waters, the State has also studied quality. Each stream, reservoir, and lake has been investigated and rated numerically (1 to 5) for esthetics, availability for use, and capability to produce fish. Resulting values were then multiplied by factors of 1 for esthetics, 2 for availability, and 4 for productivity. A composite rating was made and used to assign a body of water to a class. Classes range from Class I, the best fishing, to Class VI, the poorest. Only waters designated as Class I, II, or III are of major importance to the statewide fisheries resource. Waters in Classes IV, V, and VI are of minor or negligible importance either because they were originally poor or have been degraded by some use of man.

There are about 62 miles of Class I stream, 451 miles of Class II stream, and 2,522 miles of Class III stream in Utah. The Bonneville Unit area contains approximately 5 miles of Class I stream, 111 miles of Class II stream, and 1,064 miles of Class III stream. The 5 miles of Class I stream are located on the Provo River immediately below

Deer Creek Reservoir. About 50 miles of Class II stream are in the Uinta Basin and 60 miles are in the Bonneville Basin. Of the Class III streams, approximately 150 miles are located in the Uinta Basin and 900 miles in the Bonneville Basin.

Within the Bonneville Unit area about 244 miles of stream would be affected by the construction and operation of the Unit. Of this amount, approximately 39 miles would be lost by inundation and 205 miles would receive reduced flows. Approximately 151 miles of the impacted streams are classified as having significant fishery importance. About 30 miles of stream would realize improved flow patterns for fisheries and 5 miles of stream would receive excessive flow.

The removal of water from a stream in itself does not necessarily reduce the capacity of the stream to produce fish. The U.S. Forest Service and the State Division of Wildlife Resources have determined the minimum flows required to preserve existing fish populations and maintain aquatic habitat in some of the sreams to be affected by the Bonneville Unit. Streamflow studies indicates that on some Uinta Basin streams, tributary inflow would be sufficient to meet and exceed the recommended minimum flows for a portion of the stream channels below Unit features. It is expected that when the recommended flows for upstream points would be reached and exceeded, existing fish populations at downstream locations would be able to survive and sustain themselves and the aquatic habitat would not be degraded to a point where it would be completely lost.

The Unit would reduce the flow in approximately 196 miles of the State's 5,377 miles of quality classified streams. Considering only the good fishing sreams (Classes I, II, and III), about 128 miles (4.2 percent) of 3,035 miles of stream would be affected. Severe habitat loss is expected to occur in about 67 miles (2.2 percent) of Utah's good fishing waters. A further breakdown shows that without considering the benefits of downstream inflows, the Bonneville Unit would adversely affect about 8.1 percent of the State's Class I streams, 10.5 percent of the Class II waters, and 2.9 percent of the Class III streams. When the positive effect of stream gains are considered, the habitat losses for Class II and Class III waters are reduced to 6.8 percent and 1.2 percent, respectively.

There would be an average annual loss of 118,300 man-days of fishing in the Uinta Basin and 34,400 man-days in the Bonneville Basin. These losses are recognized as trade offs to the economics and other environmental benefits that will accrue from the project.

b. Diking of Provo and Goshen Bays

The Bureau acknowledges the concern raised over the proposed plan to dike Provo and Goshen Bays and has attempted to respond to these concerns fully and objectively. To date, the only significant action taken has been to informally solicit a study proposal of Utah Lake from the Center for Health and Environmental Studies, Brigham Young University.

The initial step of the proposal would be completion of a comprehensive literature review and a compliation and evaluation of all

existing data. Preliminary indications are that adequate study of Utah Lake would take about four years. Thus, if work were started immediately, it would not be fully completed until 1977. According to the proposed schedule for Unit construction, construction of Goshen Bay Dike would begin in 1978 and Provo Bay construction would start in 1980. Thus, if the proposed schedule is realized, there is sufficient lead time available within which to conduct the required studies. The Bureau of Reclamation intends to initiate the study program as soon as a plan can be formulated and approved. The plan would be an interagency cooperative venture having interdisciplinary aspects and be geared to complying with CEQ guidelines and the provisions of NEPA. All of the concerns listed under this issue would receive specific attention. When the environmental studies have been completed, an environmental statement covering proposed actions on Utah Lake would be prepared in compliance with NEPA. This detailed environmental statement would be processed prior to any scheduled construction work, and would thus be available for use in the decision-making process on plans for Utah Lake.

c. Future Growth along Wasatch Front and Water Supply in Uinta Basin

Ultimately, the adequacy and availability of water will shape and restrict development throughout much of the West, including both the Wasatch Front and the Uinta Basin. Future development of the Uinta Basin would be largely associated with utilization of raw materials, including oil, gas, oil shale, phosphate, and forest and agricultural products. Requirements for municipal and industrial water for the Uinta Basin have been projected to increase from

20,000 acre-feet annually at present to about 130,000 acre-feet annually by year 2020.

Water to develop these resources could be made available from the already constructed Starvation Reservoir and the proposed Jensen, Upalco, and Uintah Units, or in lieu thereof, by non-Federal developments. The above-mentioned units have a combined total annual yield of 117,600 acre-feet, all of which could be utilized. In addition, direct flows of Green River or releases from Flaming Gorge Reservoir could be diverted or pumped anywhere along the Green River channel in areas of oil shale deposits. The proposed Ute Indian Unit of the Central Utah Project could also supply about 140,000 acre-feet of water annually for municipal and industrial use.

Thus, it appears that ample water would be available for the development of Uinta Basin resources so that the growth and development of this area would not be restricted by proposed diversions of the Bonneville Unit and the opportunities for population dispersal thus curtailed.

PART III

a. Need for Project

Mr. Raskin's conclusion that the need for the Central Utah Project has not been demonstrated is based in part by misinterpretation of water supply information contained in the 1971 Great Basin Region Comprehensive Framework Study as it relates to the water supply for and development of the Bonneville Unit.

The estimated nominal annual water supplies are presented in Table 23, page 56, in Appendix V of the Framework Study. These supplies as estimated would theoretically be available at final points of discharge such as Sevier and Great Salt Lakes and represent all sources in the Bear River, Salt Lake, and Sevier Lake Subregions. The available flows quoted are mean annual flows and the Sierra Club estimate of 800,000 acre-feet surplus water available in the year 2020 assumes complete regulation of all sources of supply in all three subregions and uses without regard to location or other factors such as quality. Such complete use, for example, would dry up the Great Salt Lake including all wildlife managed and unmanaged sanctuaries. Appendix V of the Framework Study on page 97 states that an average annual principal streamflow of 1,800,000 acre-feet will be required to maintain Great Salt Lake at the 1965 level which was 11 feet below the present level.

The March 1970 interim report on the State Water Plan prepared by the Utah Department of Natural Resources, Division of Water Resources states that the potential use for water far exceeds the water supply and priorities for use will eventually need to be established. At the present time, there is a lack of reservoir capacity to store and regulate and a lack of conveyance facilities to transport the water supply to points of use.

Population projections, when based upon actual census figures and reasonable expected growth rates, are an essential part of resource development planning, particularly as they relate to municipal and industrial requirements. They are not intended to be precise but

give an indication of future distribution of people and expected water needs. Various population projections made to the year 2020 vary as much as 32 percent and no one will know until the 2020 census which one of the projections is nearest the actual count. Comparing a population projection based upon the 1970 census, adopted by the Utah State Division of Water Resources, with the higher Harline population projection used in the Bonneville Unit Definite Plan Report of 1964, at the year 1990 there is only a 9.0 percent difference. This is considered to be well within the expected accuracy of population projections. The Harline projection was used in the Bonneville Unit Definite Plan Report of 1964 because it was the most current projection available at that time.

More recent population projections proposed by a task force composed of personnel from various State and Federal agencies still show that Salt Lake County would use all of the Bonneville Unit allocated municipal and industrial water by about 1995.

b. Indian Deferral

An agreement among the Ute Indian Tribe, the Central Utah Water Conservancy District (repayment contractor for the Bonneville Unit) and the United States, acting through the Bureau of Reclamation and the Bureau of Indian Affairs, was entered into on September 20, 1965. This agreement was acknowledged by the Congress by Public Law 90-539 dated September 30, 1968. Among other things, the agreement provides for the deferment of certain Indian water rights so that construction could proceed on the Bonneville Unit of the Central Utah Project without objection from the Ute Tribe or the Bureau of Indian Affairs.

Irrigation of 15,242 acres of Indian lands would be deferred until it could be replaced by other units of the Central Utah Project to be constructed. This deferral does not in any way constitute an abandonment of the right and full replacement must be accomplished by the year 2005. In the event that the Bonneville Unit is completed as proposed and other units of the Central Utah Project are not completed sufficiently to supply the deferred Indian water rights by 2005, equitable adjustments would need to be made in Bonneville Unit water deliveries to permit the immediate Indian use of water as specified in the deferral demands. This would result in decreased diversion to the Bonneville Basin and a less efficient use of the Unit facilities.

The Ute Indian Tribe and the Bureau of Indian Affairs recognize some temporary loss of benefits associated with the deferral agreement but are willing to forego these benefits in lieu of the total benefits they would receive from the total development. The Tribe would also realize significant benefits from the Bonneville Unit. It was agreed that facilities would be provided to mitigate losses to fish, wildlife, and recreation upon the lands of the Ute Indian Tribe. The mitigation would include:

(1) a minimum of 25 c.f.s. of water in Rock Creek at the Ashley Forest Indian Reservation boundary;

(2) waterfowl management areas to be established along the Duchesne River;

(3) the operation and maintenance of the recreation, fishery, and wildlife features of the Midview Reservoir

would be transferred to the Ute Indian Tribe, and a minimum fishery pool would be maintained in the reservoir; and

(4) fishing lakes aggregating approximately 800 surface-acres would be constructed on Indian lands for fishery and recreation purposes.

Some critics contend that the quality of the repalcement water for the Indians would be inferior to the local supply that could be developed. For canals in the Uinta Basin diverting high up on the streams this would be true. For canals diverting lower down in the streams, it would not be true.

c. Rainbow Bridge

The assumption made by Mr. Raskin concerning the Rainbow Bridge ruling is speculative at this time, in light of the recent stay order by the 10th Circuit Court of Appeals to Judge Ritter's decision to limit storage in Lake Powell. The 10th Circuit Court presently has the matter under consideration.

PART IV

In a 1966 publication, the National Research Council listed several kinds of variable factors in watershed use planning, each of which requires consideration of alternatives. These include (1) alternatives of objective, (2) engineering alternatives, (3) management alternatives, (4) institutional alternatives, (5) timing alternatives, and (6) alternatives of location.

All of these have been considered in the plan formulation procedures applied to the Bonneville Unit. During preparation of the final environmental statement, various alternative sources of water and their associated environmental impacts were considered. Following are my comments on the alternatives discussed by Dr. Raskin.

a. Importation from Weber Basin

The Weber Basin Project, constructed during the period from 1956 to 1967, has an estimated total annual yield of 212,800 acre-feet of water. Of this amount, 50,000 acre-feet was designated as municipal and high quality industrial water, and the remaining 162,800 acre-feet of water was designated for irrigation.

When the Bonneville Unit was being planned, the water from the Weber Basin Project was mainly assigned to uses in Weber and Davis Counties, with lesser amounts in Morgan, Summit, and southern Box Elder Counties. Therefore, water from this project was not considered as an alternative to importation of Uinta Basin water to meet Bonneville Unit demands.

The 50,000 acre-feet of Weber Basin municipal and industrial water is being sold on a schedule that will commit the entire amount under contract by January 1990. By January 1, 1973, over 33,000 acre-feet of this municipal and industrial water was sold and in use.

Apparently this high quality water will continue to be needed in the Weber Basin [illegible] will not become availaboe to Salt Lake County for municipal and industrial uses.

Some landowners to be served by the Layton Canal and the proposed Warren Canal enlargement did not purchase the Weber Basin Project water that was designated for their areas; as a result, this water is still unobligated. At present, 56,500 acre-feet of water are available in Willard Reservoir.

The quality of this water is too poor for direct municipal and industrial uses. However, it could be exchanged for high quality water in the Davis-Weber Canal. It is estimated that only about 80 percent of this water could be converted to firm municipal and industrial supplies because of irrigation shortages represented in estimates of yield and because of a change from an irrigation-demand pattern to a municipal-and-industrial demand pattern. Exchanges from Willard Reservoir for municipal and industrial purposes would require 150,000 acre-feet of additional storage on the upper Weber River to regulate the flows and make the exchange. A firm municipal and high quality industrial water supply of about 45,000 acre-feet annually would then be available to Salt Lake County. This is only about one-half the amount developed for this purpose by the Bonneville Unit and is therefore not a complete alternative.

Development of Weber River water for municipal and industrial use in the Jordan River area would prevent further use of this water in the Weber River area. Future demand for lower quality water from Willard Bay Reservoir for use in the Weber Basin area is probable. A reduction in national defense activities in the area could reduce employment opportunities and cause a return to farming activities. Water in Willard Reservoir would then be needed for agriculture

as originally intended. Industrial development requiring lower quality water is occurring around the Great Salt Lake and could create a demand for the yield of Willard Bay Reservoir in the future.

b. Ground Water

To determine the usefulness and effectiveness of an underground aquifer, the quality, quantity, and location of the available water must be determined. In addition, the characteristics of the aquifer, including depth, recharge, and hydraulic conductivity, must be determined. Large-scale ground water developments are not feasible where the transmissibility is much less than 20,000 cubic-feet per-foot-per-day. The quality of ground water also affects its value, particularly for municipal uses. Use of ground water containing greater than 500 mg/l of total dissolved solids is not recommended by the U.S. Public Health Service for household use when water of better quality is available.

Ground water investigations have been made in most major ground water development areas of Utah by the U.S. Geological Survey, in cooperation with the Utah State Division of Water Resources. The Bureau of Reclamation has made additional studies in the areas of concern, where more detailed studies and greater refinement of potential development is needed. These studies include Salt Lake County, Utah County, Juab Valley, the Sevier River area, and the Uinta Basin.

Salt Lake County has the greatest municipal and industrial water requirement and is scheduled to receive 70,000 acre-feet of water

annually from the Bonneville Unit for municipal use. This is a greater amount than can reasonably be expected from the ground water source. An estimated 30,000 acre-feet of high quality ground water is all that is presently available for development in Salt Lake County. For the proposed plan we assume that this water would meet the demand prior to the Bonneville Unit water.

c. Advanced waste-water Treatment

If tertiary treatment were used, this water could be used for higher quality industrial uses. Much public education and breaking down of public resistance would be required before this water could be used for household consumption. Plants have been constructed that produce potable quality water directly from sewage effluents. One of these is the South Tahoe Water Reclamation Plant, which started operation in March of 1968. It has since processed over a billion gallons of drinking-water-quality effluent. The increased cost for this treatment over secondary treatment is about $0.17/1,000 gallons. Water from treatment plants could be used for many purposes other than human consumption, such as watering golf courses and parks in the proposed Jordan River Parkway; supplying water for golf course water hazards, for fish ponds and decorative water fountains in parks, and for public swimming lakes; recharging the ground water basin; watering lawns through a separate system; and many industrial uses. In Salt Lake County this water could be injected into the ground water basin as a barrier to keep salt water from intruding into the ground water reservoir as it was drawn down from increased use. This treated water would also help the water

quality and reduce stream pollution. However, rights to the use of this sewage effluent already exist, and if it were taken for other uses, a replacement source of water would be required.

One of the problems with tertiary treatment would be the reliability of the wastewater reclamation plants in their operations with respect to public health protection. A study conducted in the in the Central Valley of California showed that 30 to 60 percent of these plants had a serious faliure sometime during the year. Plant alarms, emergency power supply, short-term retention reservoirs, long-term emergency disposal areas, standby equipment, and multiple units could be used to insure that untreated effluent is not released into areas of human contact. The degree of reliability would depend on the degree of public exposure to reclaimed water.

Industrial reuse-recycle projects could also be used for water conservation. The ultimate goal of this method would be to have no effluent discharge from the cycle. This would also reduce the pollution from outflow because the waste residues would be taken from the system and disposed of in a suitable manner.

The main drawbacks of recycling and reuse of wastewaters are the high initial cost and operation of equipment and public resistance to the use of this water for either human contact or consumption.

c. More Efficient Uses and Management Practices

The demands on the water resources of any area necessitate that thorough planning and efficient management be made an integral part

of all development plans. The process of increasing management efficiency and the efficiency of physical features is continuous because of everchanging water uses and the development of new and better materials, equipment, methods, and technological advances. Therefore, increased efficiency should not be an alternative to water development plans such as the Bonneville Unit, but should already be incorporated as part of the plan. Many of the methods and concepts available for more efficient water uses are resisted by the public because a change from the traditional would be required.

Numerous programs are already planned and other methods are available for more efficient water uses. Bureau of Reclamation irrigation scheduling and water management programs have been initiated in other areas and are due to be implemented in the Uinta Basin area in a pilot program during fiscal year 1973. This program would provide for improvement of farm irrigation efficiencies by assuring the proper amount and timing of water applications to the crops.

Irrigation-systems improvement is another program being initiated in the Uinta Basin. This program includes automation of water-control structures, installation of sprinkler irrigation systems , lining of canals, replacing open canals with pipe systems, coordinating operation of reservoirs, improving maintenance of existing structures, replacing obsolete farm structures, and providing education in proper use and maintenance of these facilities.

e. Changed Water Use

The Bureau recognizes that retirement of some irrigated land will result from urban and industrial expansion. Water rights from these retired lands could be transferred to M&I uses.

PART V

a. Termination of funding

Where it is not practicable to reasses the basic course of action (as is the case with the Bonneville Unit) continuing major actions must be shaped to minimize adverse environmental consequences. It is also important to account for environmental consequences not yet fully evaluated at the outset of the Unit. The environmental statement process is not intended to stop or delay ongoing actions but instead is intended to evaluate the environmental impacts of the incremental features of the Unit.

A delay of more than 12 months has already occurred in the construction schedule for the Bonneville Unit as a result of the time required to prepare and process the environmental statement to its present state. The final environmental statement is presently under review to see if all environmental concerns have been considered. The final environmental statement is providing the decisionmaker an opportunity of reviewing the environmental consequence of the project. The decision on how to proceed with the project and to make appropriate modifications can then be made with the full knowledge of the environmental consequences.

b. Deauthorization

A national policy is currently being studied regarding projects which have been authorized years ago and not yet funded. The Bureau will abide by the resulting adopted policy.

c. Investigations of Uintah and Ute Indian Units

Congress in its wisdom saw fit to appropriate monies for studies on the Uintah and Ute Indian Units. We feel these studies should be completed to determine the best plan of development for these units. Therefore, we intend to seek funding for continue multiple disciplinary studies of these units as appropriate.

d. Termination of Bonneville Unit

I previously commented on the need for development of the Bonneville Unit under Part IIIa.

e. Return Water to Ute Tribe

I previously commented on the Ute Indian deferral under Part IIIb.

Central Utah Project, Upalco Unit, Utah

Senator Bible. There is no appropriation request but local interests have asked for $800,000. What is your capability on the Upalco Unit?

Mr. Keating. Mr. Chairman, we have no capability for the Upalco Unit at this time. Further work on the project should await completion of salinity studies now underway.

Senator Bible. Would you submit a fact sheet on this Upalco Unit.

Mr. Keating. Yes, sir.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost	$22,634,000
Allocation to date including F.Y. 1973	1,111,385
Budget Request, F.Y. 1974	-0-

Authorization: P.L. 84-485, April 11, 1956

Status:

Advance planning studies are complete and a report was approved June 20, 1969.

Location and Description:

The Upalco Unit of the Central Utah Project is located in Duchesne County near Roosevelt, Utah, on the Lake Fork and Yellowstone Rivers. This is a multipurpose project which will supply supplemental irrigation water to approximately 27,500 acres of non-Indian lands and 15,000 acres of Indian lands. Recreation and fish and wildlife and flood control benefits will also result from the project.

The Upalco Unit would serve an economically depressed segment of Duchesne County. The County has both high unemployment and under employment. In 1972, the available Indian Labor Force on the Uintah and Ouray Reservation was 456. The total employed on both permanent and temporary jobs was 296, leaving 160 or 35 percent unemployed. By comparison the average unemployment rate for the State of Utah is 6 percent. The Unit is designed primarily to stabilize and improve an existing substandard economy.

The benefit-cost ratio for this project is 1.3 to 1. The average annual benefits of $1,122,700 are broken down as follows:

Irrigation	$ 813,000
Fish and Wildlife	218,300
Recreation	60,600
Flood Control	12,800
Area Redevelopment	18,000
Total	$1,122,700

DALLAS CREEK PARTICIPATING PROJECT, COLO.

ADVANCE PLANNING

Senator BIBLE. There is no appropriation request but local interests have requested amounts up to $3 million. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this project is $300,000. This amount would be used in the connection of preconstruction design data. The local interests request $3 million to initiate construction of this project in fiscal year 1974. The construction start program is a more aggressive program than we would recommend pending the completion of the salinity study of the Colorado River. This salinity study is scheduled to be completed in fiscal year 1974.

Senator BIBLE. Since this project is not covered in the 1974 justification material, would you submit a fact sheet for the record?

Mr. KEATING. Yes, sir.

[The statement follows:]

Summarized Financial Data

Total Estimated Federal Cost	$49,500,000
Allocation to date, including F.Y. 1973	698,288
Budget Request, F. Y. 1974	-0-
Balance to Complete after FY 1974	48,801,712
Additional Capability in FY 1974	300,000

Authorization: P.L. 90-537, September 30, 1968

Status and Capability:

The Definite Plan Report is nearing completion. The FY 1974 budget contains $500,000 to provide for review of the effects of authorized projects not yet under construction on the increasing salinity of the Colorado River. The Dallas Creek Project is one of these projects.

An additional $300,000 could be used in FY 1974 for preconstruction design data collection.

Location and Description:

The project is located in Ouray and Montrose Counties of west-central Colorado. The multipurpose project will develop water of the Uncompahgre River and its tributaries in the Upper Colorado River Basin to provide supplemental water for 3,470 acres of presently inadequately irrigated land, a full supply of water for 3,880 acres of land, and 55,000 acre-feet annually of municipal and industrial water to the rural towns of Olathe, Montrose, Delta and surrounding areas. Recreational and fish and wildlife values will be enhanced by operating project reservoirs, under specified criteria and constructing specific facilities including a waterfowl production area. Flood control benefits will be provided.

The benefit-cost ratio is 1.65 to 1. The average annual benefits of $2,825,000 are broken down as follows:

Municipal and Industrial Water	$ 421,000
Irrigation	1,983,000
Recreation	324,000
Fish and Wildlife	80,000
Flood Control	17,000
Total	$2,825,000

DOLORES PROJECT, COLO.

ADVANCE PLANNING

Senator BIBLE. There is no appropriation request but local interests have requested $450,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this project is $310,000. This would be used to complete the plan formulation, land classification, drainage, water supply, plans and estimates, and economic analyses. The environmental statement will also be completed. The local interests have requested $450,000 which is a more aggressive program than we would recommend considering the state of the project planning program.

Senator BIBLE. Would you submit a statement on this project for the record since it is not in the 1974 budget?

Mr. KEATING. Yes, sir.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost	$ 52,124,000
Allocation to date, including FY 1973	781,921
Budget Request, FY 1974	-0-
Balance to Complete after FY 1974	51,342,079
Additional Capability in FY 1974	310,000

Authorization: P.L. 90-537, September 30, 1968

Status and Capability:

The FY 1974 budget contains $500,000 to provide for review of the effects of authorized projects not yet under construction on the increasing salinity of the Colorado River. The Dolores Project is one of these projects.

Advance planning studies are well advanced. An additional $310,000 could be used in FY 1974 to complete the plan formulation, land classification, drainage, water supply, plans and estimates, and economic analyses. The environmental statement will be completed.

Location and Description:

The project is located in Montezuma and Dolores counties in southwestern Colorado. This is a multipurpose project which will provide 6,100 acre-feet annually of municipal and industrial water supplies, recreation, fish and wildlife, flood control, and water quality control benefits. The project will also provide a full water supply for the irrigation of 32,340 acres and a supplemental supply for 28,660 acres. Fifteen hundred acres of the full service lands would be located on the Ute Mountain Ute Indian Reservation near Towaoc.

Recent plan modifications will include several significant increases in project purposes. Municipal and Industrial supplies have been increased for the two county area with new M&I supplies allocated for the Ute Mountain Ute Indians near Towaoc. Irrigation development has also been expanded on Indian reservation lands to satisfy needs of the tribe. Sprinkler irrigation development will be proposed and a water supply developed for a fishery below McPhee Reservoir. These downstream releases will maximize the recreation benefits and enhance the environmental impact of the project on the Dolores River.

The benefit-cost ratio for this project is 1.67 to 1. The average annual benefits of $3,851,300 are broken down as follows:

Irrigation	$ 3,378,400
Municipal and Industrial Water	178,700
Fish and Wildlife	61,800
Recreation	188,700
Flood Control	22,000
Water Quality	8,300
Area Redevelopment	13,400
Total	$ 3,851,300

FRUITLAND MESA PARTICIPATING PROJECT, COLO.

Senator BIBLE. There is no appropriation request but local interests have asked for amounts up to $2 million. What is your capability on the Fruitland Mesa participating project?

Mr. KEATING. Mr. Chairman, we recommend that the next steps on the Fruitland Mesa project be deferred until data from salinity studies becomes available. It is anticipated that these studies will be completed near the end of fiscal year 1974.

Senator BIBLE. A fact sheet is needed for this project.

Mr. KEATING. We will be glad to supply that for the record.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost.....	$34,189,000
Allocation to date, including F.Y. 1973.....	1,205,705
Budget Request, F.Y. 1974.....	-0-

Authorization: P.L. 88-568, September 2, 1964

Status:

Definite Plan Report was completed in June 1967. Gould Canal Structure Replacement contract will be completed in F.Y. 1973. $500,000 for purchase of right-of-way has not been apportioned for use.

Location and Description:

The project is located in the Gunnison River Basin of the Upper Colorado River Basin in Montrose and Delta Counties. This is a multipurpose project which would provide supplemental water for 7,010 acres of presently inadequately irrigated land and a full supply of irrigation water to 15,870 acres of land. In addition, recreation and fish and wildlife benefits will be provided. This project would bolster the existing economy, which is depressed and suffers from gradually reduced grazing permits on Federal land and from annual water shortages, by providing late season water and increased acreage for supplemental feed for the livestock economy.

The benefit cost ratio for this project is 1.52 to 1. The average annual benefits of $2,043,200 are broken down as follows:

Irrigation.....	$1,876,500
Recreation.....	151,200
Fish and Wildlife.....	13,000
Timber Production.....	2,500

SAN MIGUEL PROJECT, COLO.

ADVANCE PLANNING

Senator BIBLE. There is no appropriation request but local interests have requested $220,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this project is $220,000. These funds would be used for land classification studies to aid in determining the salinity of return flows, economic studies, and the collection of design data.

Senator BIBLE. Details on this project was not included in the 1974 budget. Would you furnish the appropriate data for the record?

Mr. KEATING. Yes, sir.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost	$71,182,000
Allocation to date, including FY 1973	341,993
Budget Request, FY 1974	-0-
Balance to Complete after FY 1974	70,840,007
Additional Capability in FY 1974	220,000

Authorization: P.L. 90-537, September 30, 1968

Status and Capability:

The FY 1974 budget contains $500,000 to provide for review of the effects of authorized projects not yet under construction on the increasing salinity of the Colorado River. The San Miguel Project is one of these projects.

Advance planning studies began in FY 1972. An additional $220,000 in FY 1974 could be used for land classification studies to aid in determining the salinity of return flows from Paradox Valley and Dry Creek Basin. Economic studies and the collection of design data would be continued.

Location and Description:

The San Miguel Project is located in San Miguel and Montrose Counties of southwestern Colorado in the Upper Colorado River Basin. The project would provide a firm supply of 44,000 acre-feet for municipal and industrial purposes. It would develop water of the San Miguel River for irrigation of 26,420 acres of full service and 12,530 acres of supplemental service land. Recreation facilities would be provided at project reservoirs and fish and wildlife conservation measures taken. A waterfowl management area would be included at Radium Reservoir.

The benefit-cost ratio for this project is 1.34 to 1. The average annual benefits of $4,039,500 are broken down as follows:

Irrigation	$ 2,954,500
Municipal and Industrial Water	790,000
Fish and Wildlife	193,000
Recreation	40,000
Flood Control	62,000
Total	$ 4,039,500

SAVERY-POT HOOK PARTICIPATING PROJECT—COLO.-WYO.

Senator BIBLE. There is no appropriation request but local interests have asked for $750,000. What is your capability on the Savery-Pot Hook project?

Mr. KEATING. Mr. Chairman, we recommend that initiation of construction on the Savery-Pot Hook project be deferred until the salinity studies are completed. It is anticipated that data from this study will be available near the end of fiscal year 1974.

Senator BIBLE. Mr. Keating, we need a fact sheet for this project.

Mr. KEATING. Yes, sir; we will furnish the sheet for the record.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost	$45,350,000
Allocation to date, including F.Y. 1973	1,074,782
Budget Request, F.Y. 1974	-0-

Authorization: P.L. 88-568, September 2, 1964

Status:

Definite Plan Report was published in June 1971. $250,000 has been appropriated to initiate construction, however, these funds have not been apportioned for use.

Location and Description:

The project is located in the Little Snake River Basin in Moffat County, Colorado and in Carbon County, Wyoming. This is a multipurpose project which would provide a full supply of irrigation water to 17,920 acres of land and supplemental water supply to 14,330 acres of inadequately irrigated land. The project will also provide benefits for recreation, fish and wildlife and flood control.

The benefit cost ratio for this project is 1.39 to 1. The average annual benefits of $2,387,000 are broken down as follows:

Irrigation	$ 2,265,400
Recreation	39,200
Fish and Wildlife	51,900
Flood Control	30,700

CURECANTI-SHIPROCK 230-KV TRANSMISSION LINE, TRANSMISSION DIVISION, UPPER COLORADO RIVER STORAGE PROJECT, COLO.-N. MEX.

Senator BIBLE. There is no appropriation request but local interest have requested amounts up to $150,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this project is $100,000. This would be used to prepare the final environmental statement, to complete field surveys, and to prepare designs and specifications. Local interests have requested $150,000 which reflect a more aggressive program than we now feel is possible of achievement.

Senator BIBLE. Would you submit a statement on this new transmission line for the record?

Mr. KEATING. Yes, sir.

[The statement follows:]

Summarized financial data

Total estimated Federal cost	$11,700,000
Allocation to date, including fiscal year 1973	362,950
Budget request, fiscal year 1974	—0—
Balance to complete after fiscal year 1974	11,337,050
Additional capability in fiscal year 1974	100,000

Authorization: P.L. 84-485, April 11, 1956, P.L. 92-370, August 10, 1972.

Status and capability

Funds included in the F.Y. 1973 appropriation permitted starting collection of field design data and land acquisition for Curecanti-Shiprock, 230-kv transmission line No. 2.

The additional amount of $100,000 could be effectively used in F.Y. 1974 for preparing the final environmental statement, completing field surveys, and preparing designs and specifications.

Location and description

The proposed Curecanti-Shiprock No. 2 230-kv transmission line would be approximately 150 miles in length and would run parallel and adjacent to the Curecanti-Shiprock No. 1 230-kv transmission line located in southwestern Colorado and northwestern New Mexico. The transmission line would traverse portions of Montrose, Ouray, San Miguel, Dolores, and Montezuma Counties, Colorado, and San Juan County, New Mexico. The Curecanti substation is located near Cimarron, approximately 20 miles east of Montrose, Colorado, and the Shiprock substation is located about 16 miles west of Farmington, New Mexico.

HAYDEN-AULT 345-KV TRANSMISSION LINE, TRANSMISSION DIVISION, UPPER COLORADO RIVER STORAGE PROJECT—COLO.

Senator BIBLE. There is no appropriation request but local interests have requested amounts up to $150,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this project is $100,000. Through the combination of $100,000 in Federal funds, and $750,000 in non-Federal funds, construction could be initiated on both the Hayden substation, Stage 03, and the Hayden-Ault 345-kv transmission line.

Senator BIBLE. Would you submit a fact sheet on this transmission line for the record?

Mr. KEATING. Yes, sir.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost.....	$12,143,000
Allocation to date, including F.Y. 1973.....	483,000
Budget Request, F.Y. 1974.....	361,000
Balance to complete after F.Y. 1974.....	11,299,000
Additional Capability in F.Y. 1974.....	-0-
Federal Funds.....	100,000
Non-Federal Funds to be advanced.....	750,000

Authorized: P.L. 84-485, April 11, 1956, P.L. 92-370, August 10, 1972

Status and Capability:

Field design data has been completed for the proposed Hayden substation, Stage 03 and preconstruction activities are underway on the Hayden-Ault 345-kv transmission line.

With the commitment of $100,000 in Federal funds to start Stage 03 of the Hayden substation, additional non-Federal funds amounting to $750,000 would also be available to initiate construction of both the Hayden-Ault 345-kv transmission line and the Hayden substation. $450,000 of the non-Federal funds is earmarked for purchase of right-of-way and initiation of construction on the Hayden-Ault 345-kv transmission line. The substation is a five party venture in which the Bureau will contribute 28 percent of the total cost while the transmission line is a three party venture in which the Bureau will contribute 38 percent. Execution of a joint participation contract is anticipated early in F.Y. 1974, upon which non-Federal funds are expected to be made available for expenditure in F.Y. 1974.

Location and Description:

The Hayden substation is located 4 miles east of Hayden, Colorado, and consists of a 230-kv switchyard, a 115-kv switchyard, a control building, transformers, reactors, appurtentant structures, miscellaneous equipment, and wiring. Stage 03 construction of the substation will provide terminal facilities for the planned Hayden-Ault transmission line, 230-345-kv transformation facilities, and facilities for interconnection to the Yampa Project steam-electric generation.

The Hayden-Ault 345-kv transmission line extends 165 miles from the Hayden substation through Steamboat Springs to Ault, Colorado, which is 10 miles north of Greeley.

WEST DIVIDE PROJECT, COLO.

ADVANCE PLANNING

Senator BIBLE. There is no appropriation request but local interests have requested $125,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this project is $125,000. These funds would be used to initiate advance planning on this project.

Senator BIBLE. This project is not included in the 1974 budget. Would you provide appropriate data on this project.

Mr. KEATING. Yes, sir.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost	$105,524,000
Allocation to date, including FY 1973	1,019,466
Budget Request, FY 1974	-0-
Balance to complete after FY 1974	104,504,534
Additional Capability in FY 1974	125,000

Authorization: P.L. 90-537, September 30, 1968

Status and Capability:

Feasibility studies were completed March 1966. The FY 1974 budget contains $500,000 to provide for a review of the effects of authorized projects not yet under consideration on the increasing salinity of the Colorado River. The West Divide Project is one of these projects. An additional $125,000 could be utilized to initiate advance planning studies leading to preparation of a definite plan report on this project.

This project has strong local support from the Colorado River Water Conservancy District and the State of Colorado. There is an increasing need to provide M&I and irrigation water in the area.

Location and Description:

The project area is located in Mesa, Garfield, and Pitkin Counties of west-central Colorado in the Upper Colorado River Basin. It would develop water from a series of Colorado River tributaries south of the river. This is a multipurpose project which would provide supplemental water for 21,030 acres of presently inadequately irrigated land and a full supply of water to 18,890 acres of land. The project would provide 77,500 acre-feet annually of municipal and industrial water. The project would also provide benefits to recreation, fish and wildlife, and flood control.

The benefit-cost ratio is 1.80 to 1. The average annual benefits of $7,481,100 are broken down as follows:

Irrigation	$ 5,260,000
Municipal and Industrial Water	1,979,100
Recreation	156,200
Fish and Wildlife	63,800
Flood Control	22,000
Total	$ 7,481,100

LOAN PROGRAM

LA BRANZA WATER DISTRICT, CALIF.

Senator BIBLE. There is no appropriation request but local interests have asked for $258,000. What is your capability for the LaBranza Water District?

Mr. KEATING. Mr. Chairman, the loan application has not been as yet reviewed. Therefore, we have no basis to recommend a fiscal year 1974 program.

POND-POSO IMPROVEMENT DISTRICT, CALIF.

Senator BIBLE. There is no appropriation request but local interests have requested $50,000. What is your capability on this project?

Mr. KEATING. Mr. Chairman, our capability on this project is $50,000. This amount would enable the district to proceed with final project planning, make a service area selection, prepare details of water marketing and complete other activities prerequisite to final design of the project facilities.

Senator BIBLE. Would you submit a statement on this proposed new loan project for the record?

Mr. KEATING. Yes, sir.

[The statement follows:]

Summarized Financial Data:

Total Estimated Federal Cost	$8,970,000
Allocations to date including F.Y. 1973	-0-
Budget Request F.Y. 1974	-0-
Balance to Complete after F.Y. 1974	8,970,000
Additional Capability in F.Y. 1974	50,000

Authorization: P.L. 984 Loan

Status and Capability:

The Federal loan would be used to assist in constructing a surface water irrigation distribution system. We anticipate the loan application will have completed its 60-day waiting period before Congress by midsummer.

The availability of $50,000 would enable the District to proceed with final project planning, service area selection, details of water marketing and other activities prerequisite to final design of project facilities. Construction could begin in F.Y. 1975.

Location and Description:

The District comprises about 22,000 acres of presently developed agricultural lands located in the northeasterly portion of Semitropic Water District in Kern County, California. The District has contracted with Kern County Water Agency to supply import water from the State of California Aqueduct to sustain the agricultural economy of the area.

San Luis Water District, Calif.

Senator Bible. The budget request for this project is $1,100,000 while local interests have requested $3,470,000. What is your capability?

Mr. Keating. Our capability is $3,070,000 including $270,000 of prior year carryover funds or an increase of $1,700,000 in the appropriation request.

Senator Bible. What would be accomplished with the additional $1,700,000? Could you also tell us what is included in the total of the local interests?

Mr. Keating. This additional $1,700,000 would be used to advance the start of construction of the District's distribution system about 2 months providing assurance that the system could be completed and in service near the end of fiscal year 1976. The request by the local interests would require a more aggressive program than we now find possible of achievement.

Colorado River Basin Project

Central Arizona Project, Ariz.-N. Mex.

Senator Bible. Mr. Robert L. Coshland, a representative of the Citizens Ad Hoc Committee, appeared in opposition to the Central Arizona project for a variety of reasons. Have you read his presentation and what comments do you offer?

Mr. Keating. Yes, I have read Mr. Coshland's statement and I would like to offer this response.

In his opening remarks, Mr. Coshland cites three reasons for appearing before this committee to testify against the Central Arizona project: (1) to inform the Congress that many people in Arizona do not favor the project because, for example, non-agricultural water users would pay more for project water than agricultural water users; (2) to inform the Congress that there have been technical and financial developments which affect the feasibility of the project, and (3) to recommend that appropriations be suspended pending the outcome of a reexamination of the above factors. Mr. Coshland then cites a series of items detailing the background for his testimony.

In response to Mr. Coshland's opening comments, our studies for project formulation have always included a water rate differential between agricultural and municipal and industrial water users. At no time has this fact been obscured but was presented to the Congress and has been understood and accepted by all major interests in the State, including State officials and the Legislature. Such a pricing structure is not new but has been used in various forms by water and power distributors everywhere for many years.

I believe it would be better if I furnished a response to the individual items of Mr. Coshland for the record, if I may, since it is quite involved.

Senator Bible. Please do so.

[The information follows:]

Water Availability

Mr. Coshland questions the availability of water from the Colorado River for the Central Arizona Project based on recent river flows, the question of the allotment of water to the Republic of Mexico, and the rate of development of water use in the Upper Colorado River Basin.

It is true that the record of flows of the Colorado River during the past five years has not altered the basis on which the Central Arizona Project was authorized.

The hydrology of the Colorado River was critically examined during the Central Arizona Project studies and related data were furnished to the Congress. The House Committee on Interior and Insular Affairs, in its 1968 report on the Colorado River Basin Project, concluded that the water supply of the Colorado River was not sufficient to meet all the future requirements of areas dependent on its flow and that water shortages were inevitable with or without the Central Arizona Project. The Committee stated further that it believed 1,200,000 acre-feet of water annually could reasonably be expected for the project until sometime between 1985 and 1995 when the priority granted to California and increasing upper basin uses would diminish the water supply unless the flow were to be augmented from other sources. The report states that, "Notwithstanding the anticipated water shortages on the Colorado River, if there is no augmentation, the committee finds that the Central Arizona Project is feasible with the presently known water supply."

In the question of the allotment of water to Mexico, there has been no change since project authorization. It was then, as

well as now, considered the first call on the river and all water yield studies so recognize it.

The future rate of development of water use in the Upper Colorado River Basin is subject to conjecture for which there is not full agreement; however, this was the case at the time of authorization of the Central Arizona Project. The only change since has been a slowdown of development which will provide more, not less, water for the Central Arizona Project.

Benefit-to-Cost Ratio

Mr. Coshland states that the 1.4 to 1.0 benefit-cost ratio existing at the time the Congress authorized the project would be considerably less than unity now if the discount rates proposed by the Water Resources Council were adopted for project analysis.

We are aware of the Water Resources Council's proposed discount rates. Economic analyses in all of our present planning studies are utilizing the discount rates annually established by the Council. The rates mentioned by Mr. Coshland as suggested by the Council have not been adopted and are therefore not presently effective and certainly not retroactively. Even so the adoption of new rates would increase benefits in some cases as well as costs.

It should be noted that the 1.4 to 1.0 benefit-cost ratio at authorization was for direct benefits only. The ratio, based on total benefits, was 2.2 to 1.0. The most recent benefit-cost ratio, based on total benefits and using escalated costs, was 1.76 to 1.0.

National Water Commission Report

The National Water Commission's proposals are not yet final as of this date and have not been adopted by the Administration or by the Congress. In any event, these proposals would not be made retroactive to include projects already authorized and under construction.

Water Quality

Mr. Coshland cites a report by the Environmental Protection Agency which states that Lake Havasu water, which contained 760 parts per million of dissolved solids in 1970, is expected to increase to 866 parts per million by 1980. He states that this quality would be in excess of the 500 parts per million standard established by the National Bureau of Health for palatability, and therefore would not be acceptable for the cities of Phoenix and Tucson. He also commented on deterioration of the ground-water aquifer through use of this water for irrigation.

These statements are speculative. The Cities of Phoenix and Tucson have indicated their intent to contract for Colorado River water with no quality reservations. In addition, many communities in Arizona, California, and Nevada have been using the water for years and have found it acceptable.

There has been no noticeable reluctance by irrigation interests to indicate a desire to contract for Central Arizona Project water and the potential supply is oversubscribed.

As to increasing the salinity of the ground-water aquifer, there is no scientific basis for this statement. Except for a few local areas, the ground-water supply is not becoming more saline. The present indications are that the intrabasin salt load is being deposited above the water table with little to no noticeable effect on the aquifer.

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Diversion of Electrical Energy

Mr. Coshland correctly notes that the Central Arizona Project would ultimately consume up to 561,000 kilowatts of the capacity to be generated by the Navajo Powerplant. This capacity would meet the project's pumping requirements for diversion of a full water supply. During the interim period after the powerplant goes on the line and before water diversions are initiated, the project power reservation will be available for use in the Pacific Southwest marketing area.

Mr. Coshland fails to note that without the project, the power requirements for pumping ground water will constantly increase as the water table declines. The import water supply will alleviate the necessity for some of this pumping. Further, the Federal portion of the Navajo Powerplant is being constructed for the specific purpose of serving the Central Arizona Project.

Fiscal Restraints

We have no comment, as this subject is within the discretion of the committee; however, we do not agree that the project is not needed.

The Carollo Report

The Carollo Report, which was never released, is understood to have been prepared on the basis of certain assumptions with regard to differences in areal unit water requirements of municipal versus agricultural use, and to the location of population outside the boundary of the Salt River Project. Until such assumptions are known, it is impossible to evaluate the validity of the report findings. However, an outside water source other than the Salt River Project is required to serve lands outside the project boundary. The City of Phoenix, in its May 1973, letter of comments on the Granite Reef Aqueduct Environmental Statement, acknowledges this need and estimates a water deficit of 30,000 acre-feet annually by the year the Central Arizona Project is completed. This statement

directly conflicts with Mr. Coshland's statement on the Carollo Report that the basin would be in a water-surplus status by the year 2000 and would have no need for the Central Arizona Project.

Prices for CAP Water

On December 15, 1972, the Secretary of the Interior and the Central Arizona Water Conservation District executed a contract for repayment of the costs of the Central Arizona Project. The district will soon be in the process of negotiating subcontracts with individual cities and districts. As the Conservation District has authority to levy an ad valorem tax upon real property in the district, it may elect to alter the water rates charged the district by the Bureau of Reclamation. To this extent, the water rates quoted by Mr. Coshland may be valid; however, they are premature and speculative.

Tucson Water Resources Report

The report by the firms of Marum and Marum, Incorporated, and Engineering Science Incorporated, which was commissioned by the City of Tucson Water Department, has not yet been made available for a full review. Therefore, in analyzing Mr. Coshland's quotations from the report, we can only note that the cost of ground water should almost always be less than import water because of minimum conveyance. As to the durability of the aquifer, we can only speculate that the 350 years to deplete the next 500 feet of stored ground water may be purely quantitative and may ignore practicability and water quality.

Exclusion of Pima County

Mr. Coshland cites an enclosed newspaper clipping from the March 29, 1973, edition of The Arizona Daily Star relating to possible exclusion of Pima County from the Central Arizona Project service area. We

certainly have no plans to exclude Pima County from the project. Many articles appeared during this period, as Pima County attempted to get State Legislature approval to create a special Pima County district to market Central Arizona Project water. The basic Federal contract with the Central Arizona Water Conservation District, which includes Pima County, remains intact.

We would also note that the newspaper article speaks of a rapidly dropping underground water table south of the city of Tucson. This area is upstream from and contributes to recharge of the Tucson aquifer.

Other Significant Publications Since 1968

Mr. Coshland cites three recent publications whose themes dwell on there being no need for the Central Arizona Project. The arguments cited from each paper are basically the same as arguments that were given in testimony during the authorization hearings. We do not believe that the need for the project, which was thoroughly documented during the hearings, has diminished since 1968.

Opposition by Arizona Legislature

Mr. Coshland cites opposition to the project by several Arizona State legislators. We can only say that the Governor's office and the State Legislature have reaffirmed support for the project many times in past years, both in testimony and in providing State appropriations to expedite project studies.

In conclusion, Mr. Chairman, we believe the State of Arizona fully supports construction of the Central Arizona Project and will continue to do so in recognition of the ground-water pumping deficit and the need for an augmenting water source to partially offset the deficit.

RATHDRUM PRAIRIE PROJECT, POST FALLS, IDAHO

EMERGENCY FUNDS

Senator BIBLE. There is no appropriation request specifically for the Post Falls unit but Senator Church has asked that $200,000 in emergency funds be provided for the replacement of a discharge line. What action is necessary to authorize expenditure of these funds for the project?

Mr. KEATING. Authorization by the Congress for such an expenditure from the emergency fund appropriation is necessary. The emergency fund authorized by the act of June 28, 1948, is available only for projects authorized by Federal reclamation laws. The Post Falls unit of the Rathdrum Prairie project was authorized under the Water Conservation and Utilization Act of August 11, 1939. The Bureau of Reclamation has been delegated the authority for administration of projects authorized under the Water Conservation and Utilization Act. However, the Post Falls unit has not been reauthorized under Federal reclamation laws and is thereby ineligible to receive emergency funds under current laws.

We agree that the need for the work on the Post Falls unit is of an emergency nature. The pumping plant discharge line is a 42-inch wooden pipeline 63 years of age and approximately 3,000 feet in length is in immediate danger of failure. A failure here would jeopardize the entire system and the crops throughout the district. Because the entire water supply is dependent on the pipeline the irrigation district is anxious to replace this pipeline as soon as possible. The total cost for this repair work is $198,000. To accommodate this proposal it would be necessary that a proviso be made to the Bureau's emergency fund appropriation as follows: "Provided: That the Post Falls Irrigation District, Rathdrum Prairie Project, Idaho, be eligible for use of emergency funds herein appropriated under the act of June 26, 1948 (62 Stat. 1052), with repayment to be accomplished under conditions satisfactory to the Secretary of the Interior."

Senator BIBLE. And now, let's see, you made a request of $334,843,000 and the House allowed you $356,358,000, an increase of $21,515,000.

Mr. KEATING. That is right, sir.

Senator BIBLE. Are you planning to reduce it or anything?

Mr. KEATING. No, sir; since it hasn't come over to us officially. I can not, of course, comment for the Office of Management and Budget.

Senator BIBLE. I understand that. I would assume the House committee action will be approved, it may not be, but, if I am correctly informed this House bill will be called up on Thursday of this week. That is the day after tomorrow, so after you have secured final House action on the bill, you study it and make whatever comment you want and furnish them to the subcommittee as soon as possible.

Senator Bellmon?

Senator BELLMON. Thank you, Mr. Chairman.

Mr. Keating, I am not sure you will be able to give me the information I want, but I would like to pursue a line of questioning for a moment.

When we earlier had the Bureau of Reclamation Department of Interior witnesses before this subcommittee, we talked about which of the Federal agencies were going to take the lead in weather modification. At that time we were told, I believe by Dr. Whitaker, the Under Secretary, that no decision had been made but it was expected there would be one by the middle of the year. Do you happen to know how close we are to getting a decision as to which agency will be the head agency in weather modification?

Mr. KEATING. No, sir, I do not. When the Under Secretary commented, he said he would take a little time on it. Since then one of the Senators wrote us a letter and asked us how close we were to a recommendation and we had to plead for more time to give it more consideration.

Senator BELLMON. Well, now, the Bureau of Reclamation has had some weather modification programs underway previous to this time?

Mr. KEATING. Yes, sir.

Senator BELLMON. Are you in a position to carry those on or expand them, or do you wish to have them dropped, or what will you do with them?

Mr. KEATING. Our work carried on in the past have been research efforts with the exception of the emergency drought relief work that we had in your state of Oklahoma and in Texas and Arizona.

The decision as to what is going to happen in the operational field is one I can't comment on because we have no decision yet from our Under Secretary and his staff as to where they would like to go in this operational field.

Senator BELLMON. Well, suppose the Chairman and members of the Subcommittee decided to put some money in your budget for weather modification for ongoing programs, would you, the Bureau of Reclamation be agreeable to use it?

Mr. KEATING. Yes, sir.

Senator BELLMON. You don't object to being in weather modification?

Mr. KEATING. No, we would like the research go a little further so we can develop a good operational program. The House has added

$400,000 to the program which is a very minimal amount. It could be more than that.

Senator BELLMON. What amount do you feel you could use wisely? Could you use 10 times that amount?

Mr. KEATING. Let us do a little work with this number and give you an answer for the record, Senator. I don't know exactly what we could use on it. It would be better if I could give you a number for the record and consult with our management people to get the Bureau position.

Senator BELLMON. How long would it take you to get this figure?

Mr. KEATING. We could get it back by tomorrow.

Senator BIBLE. That will be fast enough. That will be the fastest cooperation we have had from the Administration in a long time. [Laughter.]

Senator BELLMON. We will be taking the bill up Thursday?

Senator BIBLE. We won't. The House will take it up. We won't even start marking it up until, my tentative scheduling is to mark up the Public Works-AEC bill on July 12 or 13 in subcommittee, so we will certainly have it by then, and we will take you up in the subcommittee July 12 or 13.

HIGH PLAINS PROJECT FUND DISBURSEMENT

Senator BELLMON. In your response could you also give us some indications where these funds would be used or for what general purpose?

Mr. KEATING. Right. We will supply the information.

[The information follows:]

The sum of the further funding requirements for initiating the scale of programs needed in the High Plains is an additional $1,100,000 with a total initiation funding requirement for FY 1974 of $2,100,000 for the High Plains project. This increase would allow a total program of $4,350,000 for Atmospheric Weather Modification Research.

The additional $1.1 million would be used to:

(1) Initially establish three sites instead of the partially instrumented two sites requires an additional $600,000 as follows:

Rain gauge procurement and data processing	$250,000
One additional quantitative radar	250,000
Other instrumentation, equipment, and supplies (particularly radiosondes and aircraft instrumentation)	100,000
	$600,000

(2) Including additional maintenance costs, a total of $300,000 would be spent on additional aircraft. The present budget based on a FY 1974 program of $1 million would permit only two light aircraft for conducting the seeding tests at each of the two planned sites with about 60 hours operational time each per month. At least three aircraft with about 100 hours per month are needed to seed and observe more of the available test clouds within each area.

(3) Field research and modeling efforts to begin development of practical techniques for increasing rain from frontal and squall-line clouds, general area clouds and showers, and winter clouds require about $200,000. This would fund limited, but adequate, field measurements and development of conceptual computer programs.

Weather Modification Program on the High Plains

Senator Bellmon. I am particularly interested in the so-called High Plains cooperative program, as to whether or not you wish to press on with it.

Mr. Keating. I might give you a small comment on the high plains program.

As you know, we put together a small brochure of the high plains program. Then we called a conference of all the experts in the weather modification field to what we call "Project Skywater Conferences," one of which is going on in Denver today, and asked the experts from the other agencies including NOAA, the private sector, and the universities to discuss it with us. We sent out letters to about 100 people. The last time I heard we had close to 78 that responded and said they would be there, and they are meeting in Denver, yesterday and today, to review this program and make suggestions as to where it could be changed. I think I can get a telephone comment out of these fellows by tomorrow and perhaps give you a little more information.

Senator Bellmon. OK.

[The information follows:]

High Plains Program

Although detailed plans and design of the experiment have not been completed, budgeting for initiating the High Plains Cooperative Program with $1 million for FY 1974 indicates:

1. Only two sites with about 75 percent of the needed instrumentation will be possible.
2. Only partial test seeding will be possible the first summer.
3. No research and modeling on rain-producing clouds other than single cumulus clouds or groups or cumulus can be started.

Three sites are needed for comprehensive development—one each to study the distinctive Southern, Central, and Northern Plains cloud modification potential and the peculiar crop and watershed effects.

Work Conflict

Senator Bellmon. Is there any reason to feel that there would be conflict between any work that the Bureau might carry on and the work that the private contractors are presently doing?

Mr. Keating. Technically there is no conflict as long as everybody tells everybody else what he is doing. If anybody tries to work in secret there is going to be a conflict. If there is a complete revealing of information and desire to be helpful there is no conflict.

Senator Bellmon. Would we need in the appropriation language any requirement for proper reporting or anything of this kind.

How do we get away from this problem?

Mr. Keating. There is a bill that has been passed that gives NOAA the authority to require reporting of weather modification and they are just now implementing this program. I believe that as soon as it is implemented that this provides us enough control on this.

Senator Bellmon. Could you cite the other legislation for the record so that these funds could be used under the terms of the previous bill. In other words, we would want to be sure.

Mr. Keating. Yes, sir. I can provide that later.

[The information follows:]

COORDINATION OF WEATHER MODIFICATION

Public Law 92–205 requires that all non-Federally sponsored weather modification activities in the United States and its territories must be reported to the Secretary of Commerce. Action has been initiated to also include the reporting of all Federally sponsored activities. The law also provides for publication of summaries of these reports by the National Oceanic and Atmospheric Administration, which administers the reporting program on behalf of the Secretary of Commerce.

McGEE CREEK PROJECT

Senator BELLMON. I have one other question.

Senator BIBLE. Certainly.

Senator BELLMON. In our State, our capital city, Oklahoma City, is going to need additional water supply in about 7 years and there is presently an authorization bill pending before the House for the Bureau of Reclamation to undertake study of the McGee Creek project. You perhaps know about it?

Mr. KEATING. Yes, sir.

Senator BELLMON. This is an authorization bill that the House is considering. I introduced it in the Senate today and we hope that authorization will clear the Congress fairly rapidly.

Does the Bureau of Reclamation have the capability to undertake the study in fiscal 1974, if we can get the authorization and the appropriations through the Congress?

Mr. KEATING. Let us supply that for the record. I am sure that we do have a capability but I would like to put the number in correctly.

[The information follows:]

CAPABILITY ON McGEE PROJECT

This potential municipal and industrial water supply investigation is currently being considered in the Congress for feasibility study authorization. If this authorization is granted and if initiation of the investigation is approved, our first year requirement would be $50,000.

WEATHER MODIFICATION

Senator BIBLE. Very well.

How much money has the Bureau of Reclamation spent to date on weather modification?

Mr. KEATING. That is $34,951,580, and that is through June 30, 1972, and our program for 1973 is $6.9 million.

Senator BIBLE. So you have spent more than $40 million?

Mr. KEATING. Just about.

Senator BIBLE. What other agencies participate in weather modification?

Mr. KEATING. There are many participating to some degree. NOAA has long participated in the severe storms area. The military has participated to some degree in how to clear airports of fog.

Senator BIBLE. Why don't you furnish for the record the total Federal dollars spent on weather modification to date. I don't think the Corps of Engineers does anything in this field, does it?

Mr. KEATING. Very little.

Senator BIBLE. But I know there are other agencies that do certain work so why don't you supply for the record the actual amount of money you have been given, the Bureau of Reclamation, about $40 million, up to this fiscal year, which ends in a couple of days, and the total participation by other agencies.

Mr. KEATING. We will be glad to supply that.

[The information following:]

PROJECT SKYWATER

From FY 1962 through FY 1973, the total amount of funds spent by the Bureau in Project Skywater is approximately $41.3 million. According to the Interdepartmental Committee for Atmospheric Sciences (ICAS), which publishes an annual report on research programs of the Federal Government in the atmospheric sciences, the following amounts have been spent by all Federal agencies annually since 1963 on weather modification research:

Fiscal year—	
1963	$2,700,000
1964	3,000,000
1965	3,700,000
1966	7,410,000
1967	9,650,000
1968	11,367,000
1969	10,627,000
1970	12,019,000
1971	16,430,000
1972	19,881,000
1973	20,373,000
Total	117,157,000

Although Federal research in weather modification dates back at least to 1946, we know of no reliable source of budget reporting in the atmospheric sciences which clearly identifies the expenditures by agencies in the field of weather modification prior to FY 1963.

VERNAL UNIT, CENTRAL UTAH PROJECT

Senator BIBLE. I understand that the cost estimate for the drainage works for the Vernal unit has risen considerably above that originally contemplated. Would you please comment on this?

Mr. KEATING. At the time the repayment contract for this unit was negotiated in 1958, we estimated that the drainage work would cost $675,000. Now that the water delivery features of project have been completed and in operation for some time, the actual need for drainage works is much more definitive, also the cost of construction has risen considerably since 1958. Our present estimate for the required drainage work is $2 million.

Senator BIBLE. Are there any restrictions on the amount you may spend for drainage?

Mr. KEATING. Only that found in the repayment contract with the Uintah Water Conservancy District. This contract must be amended to raise the drainage costs to $2 million before we can begin the new works that were scheduled for fiscal year 1973.

Senator BIBLE. Are there any obstacles to amendment of the contract?

Mr. KEATING. As the district is already obligated to a high percent of its ability to repay, the amendment should not increase the district's repayment obligation.

Senator BIBLE. If appropriate language were included in the Appropriation Act, could you proceed with the drainage work?

Mr. KEATING. Yes, sir. We would suggest this language: "Provided that of the funds appropriated for the Vernal unit, Central Utah participating project, not more than $2 million may be used for construction of drainage works without increasing the water users' repayment obligation."

Senator BIBLE. How will the repayment be accomplished?

Mr. KEATING. Upper Colorado River Basin fund revenues.

Senator BIBLE. Power revenues. Is the amendatory language necessary?

Mr. KEATING. Yes, the contract ceiling for drainage construction is $675,000. The ceiling must be increased to cover the cost of the current estimated drainage facilities.

Senator BIBLE. We very much appreciate your appearance here today. I have no other questions.

Mr. KEATING. Glad to be here. Thank you, sir.

TENNESSEE VALLEY AUTHORITY

DUCK RIVER PROJECT

STATEMENT OF JACOB D. VREELAND, WASHINGTON REPRESENTATIVE

ENVIRONMENTAL IMPACT

Senator BIBLE. Our next witness will be Mr. Jacob D. Vreeland of the TVA.

I am informed you have already provided answers to our questions, is that right?

Mr. VREELAND. Yes, sir.

Senator BIBLE. They have been supplied and we will make them a part of the record.

Mr. VREELAND. Thank you.

Senator BIBLE. The Duck River Preservation Association presented a statement in which they said that no funds for the Duck River project have ever been requested by the President's Office of Management and Budget.

Mr. VREELAND. It is true that funding originated with congressional action rather than by Presidential request. The funds appropriated by Congress initially were placed in budgetary reserve. However, the budget request of the President for fiscal year 1974 proposes the use of previously appropriated funds for construction of the Duck River project. This indicates Presidential approval of the project.

Senator BIBLE. You have seen a copy of the Duck River Preservation Association statement.

Mr. VREELAND. Yes, sir.

Senator BIBLE. Please comment on the association's statements concerning environmental impact.

Mr. VREELAND. The environmental matters they mention have been fully considered in the environmental impact statement prepared on the project. After balancing these factors the TVA felt the project should continue.

PREPARED STATEMENT

Senator BIBLE. The association made comments on TVA-claimed benefits for water supply, water quality, enhanced employment, flood control, and recreation. Please supply for the record TVA's responses to these points.

Mr. VREELAND. Yes, sir.

[The information follows:]

Water Supply

The population projections used by TVA in its calculations of the Duck River project benefits are actually somewhat lower than those now being used by the Tennessee State Planning Office and the South Central Tennessee Development District. In addition, total water supply needs were studied by consultants for the four area counties, and in each instance the needs estimated by the consultant were at least equal to those projected by TVA. Accordingly, we believe that the TVA estimates are in line.

In addition to the acknowledged potential water shortage at Columbia, there is also a serious existing problem in the Town of Manchester. Manchester is now served by the Little Duck River and a nearby spring. During extremely dry periods, such as in 1954, the quality of the water in the spring becomes so poor that use of the spring has to be discontinued. TVA has investigated the alternative of providing water supply to Manchester from Tims Ford Reservoir. While constructing such a pipeline would be feasible, the economic cost of such an arrangement would substantially exceed the cost of providing a similar supply from the proposed Normandy Reservoir.

The provision of an adequate long-term water supply for the City of Columbia through the construction of small single purpose reservoirs on Fountain and Rutherford Creek is also feasible. However, from an economic and environmental standpoint, considering the Upper Duck River area as a whole, single purpose dams would not be as desirable as the proposed multiple purpose project.

Water Quality

The industries presently situated along the Duck River draw some 90 percent of their water requirements from that stream and they already recirculate their process water two or three times during periods of low flow. Even if industry succeeds in making substantial progress in further reducing the amount of wastewater per unit of production, increases in the level of production can be expected to offset a substantial share of the reduction. Our studies have convinced us that additional water will be urgently needed for both water supply and water quality improvements. Failure to act to meet these demands on the water resource will result in a limiting of economic opportunity for the people of the Duck River area.

On January 16, 1973, EPA issued a new definition of allowable water quality benefits which precludes the inclusion of low flow augmentation as a project benefit. It is TVA's view that EPA's definition does not apply retroactively.

Enhanced Employment

TVA has every reason to believe that provision of an abundant water supply will result in an increased rate of industrial expansion and location of new industries in the Duck River area. Such factors as an ample labor force, reasonable power rates, tax structures amenable to industrialization, and substantial natural and economic resources already exist in the region. An abundant water supply is one of the missing building blocks. Analyses by TVA indicate that after the project is built, industries that would employ about 3,000 people and provide an annual payroll of more than $22,000,000 (1966 wage level) could be expected to locate on these waterfront sites. An equal number of trades and service jobs would follow from the increased industrial employment and would have a payroll approaching $15,000,000. While there are other reservoirs in the region, there are very few, if any, untapped areas having a potential near that of the Upper Duck River area with the project.

Flood Control

TVA has studied all alternatives for providing flood protection along the Duck River including flood plain zoning, flood insurance, levees, channelization, alternative dam sites, and others. None was an acceptable alternative. Flood insurance is not acceptable because it is inherently more expensive, as a result of the administrative costs involved, than any economically feasible alternative that would reduce damage. The use of only insurance and zoning to minimize flood losses is not a fully applicable alternative in this case. The urban lands at Columbia and the agricultural lands from Normandy to Columbia are already intensively used. It would not be economically feasible to restrict their use under these conditions. Flood plain zoning and reservoir storage are complementary flood control measures in this situation, and flood plain regulations will continue to be needed after the project is built, although they can be based on the reduced flood hazard. The March 1973 flood, which at Columbia alone caused $700,000 in damages virtually all of which the Duck River project would have prevented had it been completed, illustrates the urgent need for the flood control benefits which the project will provide.

Recreation

As part of its work on considering alternatives for development of the recreation resources of the Duck River area, TVA did investigate the benefits and costs associated with potential use and development of the stream in its present state. As a result of this investigation, it was recognized that construction of the Duck River project would result in loss of potential for future recreation use and development of the 71 miles of stream to be impounded. However, the magnitude of this loss was judged insignificant relative to the benefits of the project and of no consequence with respect to the project's benefit-cost ratio. In fact, improved float stream conditions following completion of the Normandy unit should more than offset any float stream losses.

On the question of the number of reservoirs in this area, our studies indicate that the projected participation in reservoir-oriented recreational activities within the local and regional market areas to be served by the project will be far greater than the capacity of existing reservoirs to meet the demand. Based on activity participation rates developed by the U. S. Bureau of Outdoor Recreation, we estimate that by the year 2000, demand for reservoir-oriented recreational opportunities in the local market area alone will total the equivalent of 7,540,000 visits annually. Existing reservoirs can supply capacity for only 3,170,000 visits, leaving an unsatisfied demand in this area equivalent to 4,370,000 visits. By the year 2000, we estimate that use of the Duck River project will approach 1,450,000 visits. Since the projected unsatisfied demand is considerably larger than this level, it is quite apparent that the recreation potential of this project will be fully utilized.

TELLICO PROJECT

TIMBERLAKE MODEL CITY

Senator BIBLE. An opponent of the Tellico project, Mr. Kenneth Elrod, appeared before this committee representing the Association for the Preservation of the Little Tennessee River. Mr. Elrod said that he doubted that the proposed Timberlake model city would become a major industrial area. Could you comment on that?

Mr. VREELAND. It depends upon what Mr. Elrod means by a major industrial area. TVA does not expect Timberlake or Tellico to become the center of a Pittsburgh-type industrial complex. However, we estimate that by the end of a 25-year period after development begins that wages from industries expected to take advantage of improved sites and from the expansion in related trades and services will total $43 million annually.

EAGLE BEND EXAMPLE

Our estimates are based in part on our own experience throughout the Tennessee Valley. For example, the experience at Eagle Bend on Melton Hill Reservoir is an indication of the development that is expected to occur at the Tellico industrial area. The land base at Eagle Bend is only 10 percent of Tellico's 5,700 acres. At Eagle Bend today, two manufacturers are in operation. A third has facilities under construction and two other firms plan construction this summer. These three plants provide over 300 manufacturing jobs. The regional industrial development association that serves Eagle Bend has commitments from two firms to start construction of plants this summer. These two will have a starting employment of 425 and a potential of 1,500. The total potential employment of the five manufacturing plants at Eagle Bend is 1,800. This increase in employment will mean that about 1,200 new trades and services jobs will also be added in the area economy.

The Tellico project industrial area will be in an even better position to aid in the economic development of the Tennessee Valley region because of its significantly larger land base—5,700 acres. The forecast of employment at Tellico—4,000 basic industrial jobs and 2,600 trades and services jobs—is very conservative.

Senator BIBLE. Will you respond to Mr. Elrod's statement that TVA plans to go ahead with the project even though the State's Governor is against it?

Mr. VREELAND. We carefully considered Governor Dunn's position on the project. However, we feel that in balancing all the factors, the project should go ahead. As Mr. Wagner testified in this year's hearing before this committee, the Tellico project, if it had been completed, would have reduced by $15 million the damage suffered by the city of Chattanooga in a flood which occurred in March of this year. Mayor Robert Kirk Walker of Chattanooga in a May 18 letter to Governor Dunn pointed out the increased protection Chattanooga would receive because of Tellico project flood control features. He then asked the Governor for assistance in taking the necessary steps to prevent such damages from occurring in the event of similar flooding conditions in the future.

OPPOSITION OF EASTERN BAND CHEROKEE INDIANS

Senator BIBLE. Mr. Elrod also stated that the Eastern Band of the Cherokee Indians strongly opposes the project.

Mr. VREELAND. After we learned of the deep concern of the Eastern Band about the project we arranged a meeting with their representatives. This meeting, which was attended by members of the TVA Board and our general manager, was held a few weeks ago. Although the TVA participants felt the meeting was valuable, we understand that the Eastern Band is still considering what response it should make on the basis of what was learned at the meeting.

MEMPHIS—TVA JOINT PROJECT AND ELK RIVER COMMUNITY DEVELOPMENT PROGRAM, ALA.

Senator BIBLE. I believe we have previously discussed the matter Senators Baker and Brock testified on—the city of Memphis and TVA joint project involving the demonstration of the feasibility of a solid waste disposal project, or using solid waste to produce energy.

Mr. VREELAND. Yes, sir.

Senator BIBLE. And also the proposed Elk River Community Development Program, Alabama, about which Senator Sparkman and others are interested.

Mr. VREELAND. Yes, sir.

HOUSE ACTION ON BUDGET REQUEST

Senator BIBLE. Do you have any additional comment that you want to make regarding the House action?

Mr. VREELAND. Not at this time; no, sir.

Senator BIBLE. What do you mean not at this time.

Are you going to be making some additional comments at a later time?

Mr. VREELAND. I doubt it. We will take a look at the report. There isn't anything in there we feel we should appeal.

Senator BIBLE. They gave you $2½ million more than you asked for.

Mr. VREELAND. That is right.

Senator BIBLE. You wouldn't appeal that increase, I wouldn't think.

Mr. VREELAND. I don't believe so.

Senator BIBLE. Well, I have no further questions. Unless Senator Bellmon has——

Senator BELLMON. I have no questions.

Senator BIBLE. We thank you very much for coming up here today.

Mr. VREELAND. You are welcome, sir.

CONCLUSION OF HEARINGS

Senator BIBLE. If there are no other matters to take up, this will bring our fiscal year 1974 hearings on the Public Works-AEC appropriation bill to a conclusion. If it is all right with the members of the subcommittee, I will confer with you after the Fourth of July recess, when we return, to set a definite date for the markup of the bill. It will probably be around July 12 or 13, since we aren't scheduled to come back until July 10. Thank you all very much.

[Whereupon, at 4:05 p.m., Tuesday, June 26 the hearings were concluded and the subcommittee was recessed to reconvene at the call of the Chair.]

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