

HOUSTON SHIP CHANNEL AND BUFFALO BAYOU, TEXAS

HEARINGS

BEFORE THE

COMMITTEE ON RIVERS AND HARBORS HOUSE OF REPRESENTATIVES

SEVENTY-FIFTH CONGRESS

THIRD SESSION

ON THE SUBJECT OF

THE IMPROVEMENT OF HOUSTON SHIP CHANNEL AND BUFFALO BAYOU, TEX.

JANUARY 11, 1938



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HOUSTON SHIP CHANNEL AND BUFFALO BAYOU, TEX.

TUESDAY, JANUARY 11, 1938

HOUSE OF REPRESENTATIVES,
COMMITTEE ON RIVERS AND HARBORS,
Washington, D. C.

The committee met at 10:30 a. m., Hon. Joseph J. Manfield (chairman) presiding.

The CHAIRMAN. We have before us this morning, gentlemen, House Document No. 456, Seventy-fifth Congress, second session, on Houston ship channel and Buffalo Bayou, Tex.

Congressman Thomas of the Houston district is present, also the Chief of Engineers, General Schley. Mr. Thomas, we will be glad to hear any suggestions you wish to make in regard to this matter.

STATEMENT OF HON. ALBERT THOMAS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. BEITER. Mr. Thomas, can you explain what a bayou is? I see that Buffalo Bayou is part of the title here.

Mr. THOMAS. That is the name of the stream on which the port of Houston is located, Mr. Beiter.

Mr. BEITER. What is a "bayou"?

Mr. THOMAS. It is nothing more than a creek. We call it a "creek" in my part of the country.

The CHAIRMAN. The water is still, like it is in a lake usually. It is connected with the Gulf and in flood time the water fills it up and sometimes it overflows. We have a great many of them along the Gulf coast.

Mr. THOMAS. I think "bayou" is a french term meaning "creek."

Mr. MOSIER. It really costs more money to improve a bayou than it does a creek, doesn't it?

Mr. THOMAS. I do not know as to that. I expect General Schley can better testify about that. As a matter of fact, I understand it does not cost as much.

By virtue of, I think it was a resolution out of this committee, the Army engineers—

The CHAIRMAN (interposing). A resolution by the Commerce Committee of the Senate, I believe.

Mr. THOMAS. At any rate the Army engineers have made a study of the present port needs. If I may, let me briefly give you a picture of the port of Houston. That port is situated 50 miles inland. It is right outside of the heart of the city of Houston, some 4 or 5 or 6 miles. It is on Buffalo Bayou, which is no more than a creek. The

Bayou heads about 25 miles above the turning basin, a little, old, lazy stream, in places not more than 15 to 20 feet wide until it gets down to the ship channel—I mean to the port itself, the turning basin—and of course, as it progresses toward Galveston Bay and the Gulf of Mexico it becomes wider. In some places it must be 300 or 400 yards wide.

A good many years ago, when the idea was first originated, with the thought of developing a port in Houston, a good many of our local people more or less scoffed at the idea. They thought it could not be done; that is, that it was humanly impossible, but the Army engineers, as usual, had a vision, and with the help of the Rivers and Harbors Committee the Army engineers finally set to work upon the project of deepening and widening that little, lazy bayou. As I stated a while ago, it is 50 miles inland. It goes through Galveston Bay some 25 miles. As I recall, and these figures are not exactly accurate—I do not have them with me but I am sure General Schley does—they had to cut through that bay a channel some 150, perhaps 200 yards wide. That bay is no more, on an average, than 8 or 9 feet deep until it gets down to the Gulf of Mexico, where we have deep water.

I would like, Mr. Chairman, to insert for the benefit of the record, a report prepared by one of the local daily newspapers, namely, the Houston Post, which shows in a very comprehensive fashion the amount of money that this port has saved all of the State of Texas in transportation costs.

I might say further that the port's record in tonnage each year is a new record. Each year it goes forward and surpasses its old record.

The CHAIRMAN. In that connection I will suggest that every year during the depression, except two, it increased its tonnage.

Mr. THOMAS. I think here is a fine tribute to the port of Houston, which appeared in the September issue of Fortune, September 1937. It gives a very beautiful picture and some startling facts about it. As a matter of fact, I did not know that it was really as large as it is, and if I may, let me read a short excerpt from this magazine, Fortune. It says:

Port statistics are insidious. But the tonnage standard of measurement probably best reflects the rating of a port in terms of service and of employment created. By that standard in millions of short tons the first 10 United States seaports in 1936 ranked as follows: New York first; the port of Houston second * * *.

Then it gives a picture over here with another little short paragraph, and if I may I would like to read that to you. It says:

If you want proof of the fact that natural advantages no longer make a port, try piloting a freighter from Galveston to Houston. For 25 miles you will negotiate a man-deepened channel through Galveston Bay, and then for another 25 miles you will poke your way through a meandering, land-locked, man-dredged bayou in which you can't turn around until you reach the turning basin in the heart of Houston's water front shown in the foreground of the illustration below—

And so forth. It gives some pictures here. This part of the article in full reads as follows:

[From Fortune Magazine, September 1937 issue]

. . . AND OF A CHANNEL PARVENUE

If you want proof of the fact that natural advantages no longer make a port, try piloting a freighter from Galveston to Houston. For 25 miles you will negotiate a man-deepened channel through Galveston Bay. And then for another 25 you will poke your way through a meandering, landlocked, man-dredged bayou in which you can't turn around until you reach the turning basin in the heart of Houston's water front, shown in the foreground of the illustration below. By this time you will have passed mountains of old railroad ties, bedsprings, alarm clocks, auto fenders, and I-beams, representing some 200,000 tons of stored scrap iron. And you will have realized how all the dredging, the thirty-odd wharves, the 19 newfangled locomotive cranes, the \$4,000,000 grain elevator, and other developments can represent an investment of Federal, county, and private funds amounting to \$250,000,000. And you will have been told that Houston—although naturally an oil center and an anomaly as a seaport—has, until this year, been leader for 12 years in cotton shipping: its 1936 cotton exports being valued at \$84,000,000.

Port statistics are insidious. But the tonnage standard of measurement probably best reflects the rating of a port in terms of service and of employment created. By that standard (in millions of short tons) the first 10 United States seaports in 1936 ranked as follows:

1. New York ¹ -----	97.0	6. Port Arthur-----	17.9
2. Houston-----	23.8	7. Los Angeles-----	17.7
3. Philadelphia-----	22.3	8. Boston-----	17.2
4. Baltimore-----	21.8	9. Norfolk-----	16.5
5. Beaumont-----	18.0	10. New Orleans-----	14.3

¹ 1935 latest available figure.

If I may, I would like to present this to the committee.

The Chairman. That is a magazine?

Mr. THOMAS. Yes; Fortune magazine. Which is not printed in Houston. I think it is printed some place in the East, so I offer it as entirely unbiased testimony.

Mr. SCHULTE. The city of Houston had nothing to do with the article?

Mr. THOMAS. Nothing whatsoever.

Mr. SCHULTE. It was unsolicited?

Mr. THOMAS. I think so. I am not sure. But the purpose of those remarks is merely to show you what we are attempting to do down there. We have a serious problem, and that is the problem of attempting to protect the port against floods. The last terrific flood we had was in late 1935, and as the flood began to subside I went down to the turning basin, and if I remember correctly the wharf must be from 15 to 25 feet above the level of the water, and when I got there the water was just beginning to go down from the wharf. In other words, the water had completely submerged those wharves. It destroyed thousands of dollars worth of shipping property. Shipping was paralyzed for a week or 10 days, or even longer, but the greatest damage that was done was due to the fact that when the water comes rushing in there it silts and shoals the turning basin and the entire length of the channel, and the Federal Government had to go in there before anything could be done and virtually remove, I am not attempting to say how many inches or how many feet of silt, because I am sure that the general can better testify to that than I, but anyway the Government literally spent many thousands of dollars to remove that silt and that mud from the basin and the channel before navigation could proceed. A few years

prior to that the same situation occurred, and certainly we can look for similar floods. We will constantly have those recurring floods piling in there.

The CHAIRMAN. I was a witness to the previous flood there.

Mr. THOMAS. I was living about 150 miles away at that time.

The CHAIRMAN. I happened to get into Houston that day from Washington.

Mr. THOMAS. I think gentlemen, that if the committee sees fit to report this resolution out, it will over a period of years save the Federal Government many dollars, because after these floods—and we are going to continue to have them as the forests are continually cut away, and the land of course is not a wooded country down there; it is a prairie country, but as the land is broken up and put into cultivation that drainage will be more rapid, and certainly the floods will increase with time.

Mr. GREEN. Are these floods fed by rains or by snows further up in the country?

Mr. THOMAS. No; we do not have any snow down there. Our climate is very much like yours.

The CHAIRMAN. We have heavy local rains.

Mr. THOMAS. It is a flat country and we have heavy local rains. If there are any questions by the committee I will be glad to answer them. I do not want to consume your time unnecessarily.

Mr. SCHULTE. You just made a statement in reading that article that the Government has spent \$200,000,000 improving the port of Houston.

Mr. THOMAS. I do not know whether that is accurate or not.

Mr. SCHULTE. That is the figure you read.

Mr. THOMAS. I believe it said State, county, and Federal funds.

Mr. SCHULTE. What is the estimated cost of the improvement that you are asking for?

Mr. THOMAS. I think the Army engineers plan on an expenditure of \$9,000,000 for the Government and \$3,000,000 for the local community, or a full expenditure of about \$12,000,000, if I understand their plans correctly.

The CHAIRMAN. The Annual Report of the Chief of Engineers will show what the expenditures have been. The original channel was for 25-foot depth. Local interests paid one-half the cost of dredging it. Afterward it was increased to a 30-foot project, and local interests paid one-half of that. However, there have been many additions made to it by Congress since then, on which the Federal Government paid the entire cost, and the Federal Government has paid all the costs of maintenance, amounting to a good many million dollars.

Mr. GREEN. In 1935 the value of the tonnage there is shown as \$407,000,000.

Mr. THOMAS. It is growing by leaps and bounds. Every year it makes a new record. I might say that I do not think there are two men who are better qualified to speak on the subject than are our chairman and General Schley, who is now Chief of the Army Engineers. At the time this port was just beginning to bud out into some prominence I might say that General Schley was then our district engineer, and the original steps which have eventually led to

making the port as big as it is, were conducted under the supervision of General Schley. Of course, you know that Judge Mansfield has a first-hand knowledge of the activities of the port, because he has been chairman of this committee for many years—and I might say also that part of this channel goes through our chairman's district, and he has been watching and studying its development for many years.

Mr. BEITER. What ordinarily feeds this stream? Is it fed by springs?

Mr. THOMAS. No; it is just a little, lazy, natural stream that comes from rainfall. Of course, you understand, Mr. Beiter, the bay backs into it, you see. The bay really keeps the water at its natural height. I think we have a tide in there of less than 6 inches. The water is at sea level. We are right at sea level, and the water from the bay, the Gulf of Mexico, backs in there.

I thank each and all of you for this opportunity to appear before you.

The CHAIRMAN. We thank you very much for your statement, Mr. Thomas.

We will now be glad to have a statement from you, General Schley. General Schley, as you all know, is now Chief of Engineers, and for 4 years was district engineer in Texas and had charge of much of the work in the building of this port.

STATEMENT OF MAJ. GEN. J. L. SCHLEY, CHIEF OF ENGINEERS, UNITED STATES ARMY

Major General SCHLEY. Mr. Chairman and gentlemen, the question just asked by one of the members of the committee is entered on page 2 of this document, the report on the Houston ship channel, the second paragraph near the end. The total cost to date is practically \$12,000,000, in addition to which \$2,500,000 was contributed by local interests.

Mr. SMITH of Washington. That was quite a substantial contribution by the local interests.

Major General SCHLEY. Yes, sir.

Mr. SMITH. I would consider that a very substantial contribution by local interests.

Major General SCHLEY. It was.

Mr. BEITER. In addition the maintenance costs have been quite high.

Major General SCHLEY. Quite high; yes.

Mr. BEITER. If this improvement is made will the annual maintenance be increased any?

Major General SCHLEY. No; the maintenance will be decreased.

Mr. BEITER. By approximately how much?

Major General SCHLEY. It is estimated that the dredging cost will be reduced by \$80,000 annually to the United States, and about \$60,000 to local interests. That is due to the fact that the project for the Houston ship channel requires local interests to provide the spoil areas for the dredged material, and those spoil areas are expensive to provide, because there has been so much development along the ship channel.

Mr. BEITER. And the cost of the project will be approximately \$9,000,000?

Major General SCHLEY. The cost of the project to the United States will be \$9,000,000.

Mr. BEITER. And \$3,000,000 to the local community?

Major General SCHLEY. \$12,000,000.

Mr. SCHULTE. Now, you have made the statement here that the estimated cost to the Federal Government at the port of Houston is about \$12,000,000. Is that right, or is it \$20,000,000?

Major General SCHLEY. No; the cost—if you will refer to page 2, paragraph 2, the last few lines, you will see the statement printed.

Mr. SCHULTE. The point I am trying to arrive at is this: That probably the port of Houston proper only cost \$20,000,000, but what did it cost to come up to the port of Houston that was paid by the Federal Government?

Major General SCHLEY. This is the total work of creating the port and channel of Houston, exclusive of what local interests contributed.

Mr. SCHULTE. For the length of 50 miles.

Major General SCHLEY. Yes.

The CHAIRMAN. And about 25 miles of that is through an open bay, I believe, and about 25 in the narrow channel up the bayou.

Major General SCHLEY. That is correct.

Mr. BEITER. General, if the tonnage remains the same and the savings were approximately 140,000 per year, without figuring the interest on that, that would take about 86 years to pay for this improvement, would it not, to make up the saving?

Major General SCHLEY. No; it is not computed on that basis. The benefits from flood control to anyone except the United States, you see, have not been mentioned. Those benefits merely to reduce the cost of dredging are all that have been mentioned so far. The benefits to all people, including the United States, of this flood-control project are the justification for the expenditure of \$9,000,000 by the United States.

Mr. BEITER. Providing the benefits are passed on to the consumer?

Major General SCHLEY. Oh, yes. The principle set down by Congress in the flood-control bill of June 22, 1936, provides just that, benefits, to whomsoever they may accrue, are in excess of estimated costs.

The CHAIRMAN. There is one point that seems not to have been mentioned, and that is the delay caused to ships in their operations by reason of the silting and preventing of the movement of vessels. That damage to the shipping interests has been very considerable.

Major General SCHLEY. If you will turn to page 29 of this printed document you will see that whole page, headed "Flood-control project, plan IV." The estimated benefits which justify the expenditure of \$9,000,000 by the United States are tabulated in part 2 of that statement. You will see among those items on that page, under item 2, "Dredging costs, \$80,000; spoil area investment carrying charge, \$60,000." Those are the two things which I just referred to as a saving due to maintenance.

Now, under the item "Losses to shipping" you will see—the chairman just mentioned it—the item \$20,000.

Mr. BEITER. Most of it is "Property and stock damage, \$460,000."

Major General SCHLEY. Perhaps if I may extend my statement just a little, I will clear up one or two points.

The project here before you is a flood-control project, not a navigation project, for Buffalo Bayou. Heavy rains occur not very frequently, but when they do, they are severe, as they are in that part of the United States, and they cause floods which flood a part of the city of Houston. It so happens that it is the business part which is principally flooded, and in addition to that, damages the Houston ship channel, which commences within the city of Houston. The project here before you is to reduce the damages done by those floods, and of course has nothing to do with the navigation project, except that it protects the existing navigation project from the damage due to the floods.

The CHAIRMAN. The tabulated statement shown on page 29 is limited to protection of the navigation feature, and does not take into consideration the flood protection, does it, General?

Major General SCHLEY. Yes; the flood protection is the "Property and stock damage, \$460,000."

Mr. BEITER. In addition to the \$9,000,000 that is proposed to be expended, there will be another \$12,000,000 for flood-control work?

Major General SCHLEY. No; this is all flood-control work.

Mr. BEITER. What is that statement on page 30, "Flood control, \$12,075,000; improvements, other than flood control, \$9,846,000; total, flood control and other, \$21,921,500," nearly \$22,000,000?

Major General SCHLEY. The \$12,075,500 is the total on the preceding page, page 29, the total of item 1. That is subdivision 1, estimated cost, a total of \$12,000,000. That is \$9,000,000 by the United States and \$3,075,500 by local interests. In addition to that, local interests contemplate the expenditure of \$9,846,000, which is the second item shown on the next page, covering works which the division engineer, whose report you are here referring to, considers to be self-liquidating; that is, while they are beneficial for flood, they nevertheless are beneficial to the city, in that they replace old structures by new, such as bridges, and help the development of a park. So the local interests expect to spend that \$9,846,000 in addition to the \$3,075,000, which is noted on the page before, but only the \$3,075,000 is considered to be directly chargeable to the flood benefit, flood protection. The others are more or less self-liquidating.

Mr. BEITER. Then you mean to say that the local interests expect to spend \$9,846,000?

Major General SCHLEY. Plus \$3,075,000, the \$9,000,000 being for the development of that bayou as it runs through the city to form a parkway, which, while beneficial to the floods, nevertheless is considered by the author of this report that you are now referring to, to be self-liquidating, that is, beneficial to the city in the replacement of old structures to such an extent that they will be warranted even without the flood-control feature. So it is not given here as an expenditure directed to floods.

Mr. SCHULTE. But there will be no cost to the Government?

Major General SCHLEY. \$9,000,000 to the Government. The first column on page 29.

Mr. SCHULTE. That is the point we are trying to develop here, "Improvements, other than flood control, \$9,846,000." You say the total cost will be only \$12,000,000?

Major General SCHLEY. If you are going to include these self-liquidating items which the city is going to provide, which do benefit flood control but which to a large extent are merely replacing old structures and building this parkway, then local interests will spend \$3,000,000 plus \$9,846,000, totaling \$12,846,000. It so happens that these nines and threes are identical for several items, so you will have to see which one is being spoken of. The United States spends \$9,000,000; local interests spend \$3,000,000—all directly flood-control items. Local interests also will spend \$9,846,000, which if you wish you can call parkway development. It really is more than park development, but you can call it that.

The CHAIRMAN. Then local interests have spent \$6,000,000 and over in terminal facilities there, providing, among other things, a belt railway in connection with it.

Mr. BEITER. You mean that has been spent in the past, \$6,000,000?

The CHAIRMAN. Yes.

Major General SCHLEY. That is navigation and development of the port. The bayou itself runs, as I say, through the center of the city. It is joined by one of the tributaries, White Oak Bayou, at Main Street, which is about the central point of the city—the business part. The bayou from there down to the turning basin, a distance of $6\frac{1}{2}$ miles, is a light-draft channel improved for barge transportation. At that point, $6\frac{1}{2}$ miles down, is the turning basin, which is the uppermost point of the ship channel and where the seagoing ships go to serve the port of Houston. From there down, a total of 60 miles is the Houston Ship Channel, which goes to the Gulf of Mexico. When that channel was built it followed Buffalo Bayou because that was the most economical route. They saved a great deal of dredging by following that route.

The CHAIRMAN. Above the Houston Ship Channel there is also a Government project for a shallower depth.

Major General SCHLEY. It is $6\frac{1}{2}$ miles from Main Street to the turning basin. These floods which occur in that area are cyclonic rainfalls, not very frequent but at times are extremely severe, and when they come, as I say, they flood part of the city and also carry silt into the turning basin and channel. The damage therefore might be considered damage to the city property and its business, and damage to the ship channel, in that it brings in silt, and during the very high water the water is too swift for ships to navigate. It is an expensive matter to redredge that turning basin and channel, and also during that time until it is redredged to its depth, full-draft ships cannot use it without some danger of grounding.

The rainfall records are not very complete for that section of the country. The largest flood of record is 40,000 cubic feet per second, taking the Main Street part of the waterway. However, it is computed by taking the heaviest rain of that section and applying it to that drainage area, that it can be as high as 90,000 and that you might call the size of flood for which these protective works are designed.

Now, the district engineer stationed in Galveston, who has this part of the country under his supervision, submitted the original report

and he submitted three different projects for controlling these floods. The division engineer in New Orleans, whose division covers the entire Gulf, and who reviewed this report, submitted an additional one which he calls the "fourth plan." The fourth plan is the one whose figures we have been referring to on pages 29 and 30 of this report. However, the division engineer recommended that none of these plans be definitely adopted at this time, but that the cost of that fourth plan be used as the limit which Congress put on the flood-control project. The reason that he does not recommend that plan IV be adopted definitely now is this: Local interests have to contribute considerably toward this improvement. At the time these reports were submitted, local interests had not yet completed their legal and administrative duties of forming a representative organization with whom the Government could deal, and to handle all these local interest matters. Even now, while those matters have been done, nevertheless, not yet have the Government representatives met with them and determined what their wishes are, what plans they prefer, and what plan they would be willing to expend the local funds toward. Therefore you will notice that this report differs from most of the Corps of Engineers reports, in that it leaves wide open the final form which this protection shall take, but does state the cost to the United States; and that, as I say, is based on what is called in here "plan IV."

The CHAIRMAN. Regardless of what plan is carried out, the Government expenditure will be limited to \$9,000,000?

Major General SCHLEY. Yes; to \$9,000,000. I can illustrate just in one moment the two extreme plans which are considered. One, and that is plan IV, is very briefly described as a detention reservoir proposed just above the city on Buffalo Bayou. That country being extremely flat, it amounts to a very long levee, really, with an opening at the bayou to let the water out. This water impounds between 200,000 and 300,000 acre-feet and then allows it to discharge in Buffalo Bayou at about 15,000 cubic feet per second until empty. That is the usual detention reservoir plan. That takes care of this upper drainage area of Buffalo Bayou.

In the city the channel is to be increased in size so as to take this discharge comfortably without overflowing its banks. At Main Street White Oak Bayou comes in. White Oak Bayou adds quite a bit of water, but that is to be taken care of under plan IV by merely increasing the size of the channel and not by using a detention reservoir, which, is however, in some of the other plans.

Below Main Street, in the barge part of the waterway, a 9-foot project, there is to be only an increase in the channel size, so as to take care of this water which is allowed to reach that point at the rate permitted. Then between that bayou and the turning basin there is to be a gated weir, that is, a weir with a gate in order to reduce the flow into the Bayou, into the turning basin, and in that way reduce the silt coming into the basin.

That gives you very briefly what that plan IV contemplates, for which the Government's cost will be \$9,000,000. Another plan which local interests may prefer is to divert all the water around the city into Galveston Bay, not using the bayou at all, but leaving that bayou to be merely a tidal stream, as it is in its natural state.

That shows you the extreme plans which might be adopted, depending on what local interests are willing to spend their money toward.

Either would be satisfactory to the United States, because either would protect the city and would protect the turning basin and channel.

Mr. DEROUEN. And it would not cost any more, because the cost is pegged, a limited cost fixed, and it cannot cost more than \$9,000,000.

Mr. BEITER. So far as the Federal Government is concerned, the cost would be \$9,000,000, but no more? Now, if the Federal Government decides to spend the \$9,000,000 under plan IV, would the city of Houston—would it be possible for them to back away from their contribution? That is, is there anything in the agreement whereby the city of Houston must go ahead with this plan, providing the Federal Government has spent \$9,000,000, whether it is in the present project or whether it goes around the city, as you say?

Major General SCHLEY. No; there is not.

Mr. BEITER. Well, suppose the Federal Government goes in there and spends \$9,000,000, and the city of Houston backs away and does not spend a penny?

Mr. DEROUEN. I do not think that the General understood you. There will not be any money expended, but it is provided that the cost of that project shall not exceed \$9,000,000, and there are four plans being considered. Either one of those plans, with additions to it, may be accepted by local interests, but the Government will never spend more than \$9,000,000.

Mr. BEITER. How much are the local interests going to spend?

Mr. DEROUEN. They can spend as much as they want, but they have estimated their cost in here.

Mr. BEITER. They may not spend anything?

Mr. DEROUEN. Yes; they will. They cannot do the work for that amount. It cannot be done. The total work is estimated as shown in the plans here, in the three plans.

Mr. BEITER. But it says here that certain items of this work should be properly classified as deferred maintenance, and they can defer that for years to come.

Mr. DEROUEN. But the Government is not going to spend any money until they finally adjust themselves whereby they can decide exactly which plan they are going to ask the Government to accept. You see, they work in cooperation, as I understand the plan. There are two or three ways by which they can accomplish this thing. This report says you can go ahead and accomplish either way, but the Government shall never spend more than that much money on it.

Mr. THOMAS. May I say here, should the local authorities choose the plan which you now refer to, the Army engineers' plans specifically say that the local authorities down there must furnish all of those rights-of-way and drainage districts, which will cost easily \$3,000,000.

Major General SCHLEY. If you refer to page 61 you will see the District Engineer's estimate of the cost of complete diversion is \$54,000,000. If that should be the plan adopted finally, local interests would pay all of that, less \$9,000,000.

Mr. DEROUEN. That is right. Estimated cost of Plan II, \$54,686,095.

Major General SCHLEY. Of course, the Government Engineers will not commence their work until all this is provided for. If that is the one finally adopted, local interests must have their contributions all ready, or guaranteed, before we will proceed. There is no doubt

in my mind that Plan IV or something close to that will be the one which would naturally follow from our limitation of \$9,000,000.

Mr. BEITER. I went to bed rather early last night. Maybe my head is not clear, but I still can not see it. The Army Engineers want to go in there and make certain improvements, clean out and take away the silt that has been washed in there because of the floods. Now, we agree to spend \$9,000,000, but there is nothing in the agreement whereby the city of Houston shall contribute \$3,000,000. They can back away from that contribution, according to this.

Major General SCHLEY. You mean, assuming that plan IV is to be followed?

Mr. BEITER. Yes.

Major General SCHLEY. No; plan IV, if adopted, the detailing of this plan IV would have to be first. That would be done by us working in cooperation with local interests. At the end of that time you would then know more accurately what their costs amount to, and what work is to be done with their money. It may not be \$3,000,000. It may be \$3,500,000; it may be \$2,950,000, or some other figure. Whatever it turns out to be, they must then guarantee to the United States that it will be forthcoming before we will start any part of the Government work. That is common practice in all of our work. Where local interests are to do certain work we do not proceed with our part until they have guaranteed to the United States, to the satisfaction of the Secretary of War, that that will be forthcoming.

Mr. SMITH of Washington. On page 5 of your report it is specifically stated that these different conditions must be complied with by the local interests in order for the Federal Government to make the improvement.

Major General SCHLEY. Yes.

Mr. SMITH. Those provisos are all contained in the report, citing exactly what the local interests must do, and the making of the improvement, as I see it, by the Federal Government in contributing \$9,000,000, is contingent upon local interests doing the various things which are specified in the report. Is not that correct?

Major General SCHLEY. Yes; in all of our projects, navigation improvement and flood control, the Government does not proceed to spend its part of the money on the expectation or on the hope that local interests will contribute their part. There must be a satisfactory guarantee that it will be done.

Mr. HAVENNER. What would you say would be a satisfactory guarantee in this instance?

Major General SCHLEY. In this instance I would say that if a law of Texas were enacted, creating the necessary body to handle these funds, and that body proceeds to sell bonds, as they usually do, the money is in hand, it is known to be a perfectly properly organized, established responsibility, plans are signed by their officers, being satisfactory to and accepted by them, and all that being presented to the Secretary of War would be considered satisfactory.

Mr. DEROUEN. May I make this observation to the General with regard to flood control in the State of Louisiana. We have had many difficulties, and time and again we have had to approach the Government for assistance, and the Government has in many instances assisted us, the State, provided the State would enact certain legisla-

tion which would protect the United States against damages, and also protect that part of the amount that the local interests had to provide. So in that instance we have had cases similar to this for the last 10 or 15 years in this committee, where local interests contributed a certain amount and then when the project was completed there still remained a certain amount of money due local interests, to be refunded to local interests, either as bond guarantee or money put up.

Mr. BEITER. That is true, Mr. DeRouen, but the General has stated that nothing definite has been decided or determined here.

Mr. DEROUEN. That is as to the four plans. But it is specifically determined that it will never cost the United States more than \$9,000,000. The Government is not going to spend more than that, because two problems enter into this. One of them is that it helps to improve the condition of the port and the other is the flood control project, which of necessity is the same as exists all over the United States, protects the people from damage by flood.

Mr. BEITER. I was not questioning the amount involved, that is, as far as the expenditure of the United States is concerned. I was concerned with the amount that the local interests were going to spend there. Whether it be one dollar or \$45,000,000, there is nothing definite there.

Mr. DEROUEN. I see your point of view.

The CHAIRMAN. Mr. Beiter's viewpoint is that, suppose the entire project did not cost over \$9,000,000?

Mr. DEROUEN. Then the local interests would not put up anything.

Major General SCHLEY. If I may refer you to about the middle of the paragraph appearing at the top of page 5 you will see the words "*Provided further*" in italics—the second "*Provided*" in that paragraph—"Provided further. That the local agency aforesaid shall (a)"—and so forth. Those are copied from the principles set down in the Congressional Flood Control Act of June 22, 1938, which states the principles on which work of this kind will be done. Those are the things which local interests would have to do, no matter what project is finally followed and whatever their cost may be. Their cost is estimated to be \$3,000,000 and odd by plan IV, unless you want to choose the \$9,000,000 which they are going to spend for other purposes. But whichever one is followed, those three things, a, b, c, will be required of local interests. They have to be done under the law.

Mr. DEROUEN. May I read them into the record from page 5 of your report, near the top of the page:

* * * (a) provide without cost to the United States all lands, easements, and rights-of-way necessary for the construction of the project; (b) hold and save the United States free from damages due to the construction of such works; (c) maintain and operate all of the works after completion in accordance with regulations prescribed by the Secretary of War.

Mr. SMITH. That fully protects the Federal Government.

Mr. DEROUEN. That is my understanding.

Major General SCHLEY. The committee might be interested in knowing some of the effects that the largest floods have had on the turning basin and channel. The largest flood was in 1935, and in the turning basin the water rose eleven feet and a half; in the ship

channel it rose about the same amount, commencing at the turning basin and of course being less as it approached Galveston Bay. In the turning basin there was left approximately 700,000 cubic yards of material or silt brought down by the flood, and in the channel below approximately 800,000 cubic yards. The removal of that silt in the turning basin cost 20 cents a yard, which would amount to about \$140,000 for the turning basin, and in the channel below it was removed at about 12 cents a yard, costing \$105,000. Of course, that consumes also some time.

Mr. SMITH. That flood of 1935 caused damage amounting to several million dollars, did it not, General?

Major General SCHLEY. \$2,500,000 to the city proper, in property damage.

The CHAIRMAN. Are there any further questions of General Schley?

Mr. Thomas, have you any questions you would like to ask?

Mr. THOMAS. Mr. Chairman, I do not have direct, first-hand knowledge of this situation covering a good many years, and I wish you would give the committee the benefit of your views on it.

The CHAIRMAN. Of course, I am not exactly familiar with the damage due to the flood situation. I saw the flood of 1935 there, and having been familiar with Houston for about 50 years it was a great surprise to me. Looking from the Southern Pacific Station, I saw the flood water flowing through the windows of the brick buildings along the viaduct, and previous to that time I do not think such a thing had ever occurred. The damage was tremendous, so far as that is concerned. I have no knowledge of the figures.

In regard to the tonnage on the Houston ship channel, when was that port started; that 25-foot channel? How many years ago was that? Have you got anything showing the date?

Major General SCHLEY. The 25-foot channel was completed some time before the War, I mean before the European War, in 1914. The 30-foot channel was commenced, as I recall, in 1924.

Mr. SCHULTE. What is the amount of tonnage that flows through the channel?

Major General SCHLEY. About 24,000,000 tons in 1935. It is usually about third in the United States.

The CHAIRMAN. I have the exact figures here for 11 months of this year. It was 24,666,624. That does not include the month of December. You have no report for December yet, I presume?

Major General SCHLEY. I do not think we have.

The CHAIRMAN. No; I am quite sure you have not. And if it held up for December like it did in the other months it would be around 26,900,000 for 1937.

The figures for 1934 were 16,862,000 for the 11 months.

In 1935 it was 17,957,000 for the 11 months, and in 1936 it was 20,825,000 tons for the 11 months, and for 1937 it was 24,666,000 tons for the 11 months.

From the last Annual Report of the Chief of Engineers it will be seen that the growth of commerce upon the Houston ship channel has not perhaps been equaled in any other port of the United States. The table on page 713, part 2 of this report, shows the commerce for the 10 years previous to 1937, as follows:

Comparative statement of traffic

Year	Tons	Value	Passengers	Year	Ton	Value	Passengers
1927.....	12,000,414	\$466,316,967	2,000	1932.....	12,710,432	\$302,862,869	23,964
1928.....	12,981,113	583,541,199	1,147	1933.....	16,928,507	400,875,655	18,716
1929.....	13,917,953	564,842,734	2,438	1934.....	18,516,223	445,555,065	24,463
1930.....	15,057,360	495,634,060	139,233	1935.....	19,774,071	496,902,121	8,194
1931.....	13,971,755	351,782,031	44,618	1936.....	23,800,415	619,326,957	14,437

(Statistics furnished subsequently show the commerce for 1937 to be 26,854,913 tons, valued at \$497,022,896.

Mr. SCHULTE. Does not that rank as one of the largest ports in the country?

Major General SCHLEY. The second largest now in point of tonnage. I am not speaking of the tonnage on the Great Lakes, where they have enormous tonnages of ore and coal, but of ocean ports I presume it is ahead of any other port except New York now.

Mr. HAVENNER. Is that recent increase represented by oil?

Major General SCHLEY. Oil, cotton, everything.

The CHAIRMAN. It is largely cotton. It is a port of general tonnage. The oil is principally handled about half way down the channel toward Galveston.

Mr. BEITER. The tonnage probably will increase somewhat this year if the farm bill is passed.

The CHAIRMAN. Cotton does not provide a great amount of tonnage. It provides an enormous value but it takes 4 bales of cotton to make a ton, and 4,000,000 bales of cotton would only make 1,000,000 tons.

Mr. BEITER. How much cotton did Texas grow last year?

The CHAIRMAN. Over 5,000,000 bales. Then Oklahoma comes in there and ships its cotton through these ports, Houston and Galveston, and New Mexico and Arizona ship through them to a certain extent. They do not produce a great deal of cotton, but some. The tonnage, starting at zero, say, 25 years ago, or a little less than 25, has increased to these figures during that time. The channel was first authorized for 25-foot depth, of which the local interests paid one-half the cost; later it was provided for 30-foot depth, of which local interests paid one-half the cost. In the rivers and harbors bill of 1935 we had two projects, one to increase the depth to 32 feet, which had already been done, however, by the Public Works Administration, but not authorized specifically by Congress. That bill authorized specifically the 32-foot depth, and also an additional report of the Chief of Engineers made provision for 34 feet. So when the works are completed it will be a 34-foot depth. To what extent, General, has that been carried out, the 34-foot depth?

Major General SCHLEY. I think it is under way now, Judge, not yet completed.

The CHAIRMAN. I know it is not completed yet.

Mr. BEITER. If that stream is a dormant stream, how do you take care of the pollution there? Houston has a great many factories on that stream, and if there is no current in the stream I should think the pollution would be very bad.

The CHAIRMAN. The waters are more or less polluted with oil, but we have an Oil Pollution Act applying to coastal waters, you know, where the tide ebbs and flows. That is being enforced insofar as circumstances will permit.

Mr. BEITER. The tide does not affect the city of Houston, does it?

The CHAIRMAN. Yes; the tide comes up there about 6 inches at Houston. The State of Texas also has pretty strict antipollution of water laws, and the sewage of the city is not permitted to be emptied into the stream there. I do not know what disposition the city of Houston makes of its sewage.

Mr. THOMAS. It has a disposal plant, Judge.

The CHAIRMAN. The cities and towns located on the rivers in Texas are not permitted to empty their sewage into any flowing stream under State law.

Mr. BEITER. A very good law.

The CHAIRMAN. There may have been some violations of it on some of the rivers. I know the little town in which I live on the Colorado River was forced to put in a sewage-disposal plant a number of years ago at considerable cost.

At all oil ports it is impossible to abate entirely the oil pollution. We have had a Federal statute since 1924 providing for oil pollution in our coastal waters, where the tide ebbs and flows. It does not apply to acid or other types of pollution. The great trouble about oil ports is that the tanker ships that carry oil out have to come back in water ballast, and when they return they have to empty that water out of the tankers, and there is bound to be some oil with it, and that pollutes the water to a certain extent.

Have you anything further, Mr. Thomas?

Mr. THOMAS. I do not think of anything else, Mr. Chairman.

Mr. BEITER. You think up some good things so far as the Federal Government is concerned, Mr. Thomas.

Mr. THOMAS. By the time the local community gets through paying these costs, Mr. Beiter, I am afraid they will need far more than any \$3,000,000.

Mr. SCHULTE. I am willing to abide by the decision of my good friend and colleague, Mr. Thomas.

Mr. BEITER. He is a very able representative.

Mr. THOMAS. Thank you, gentlemen.

The CHAIRMAN. The committee will now stand adjourned. (Whereupon, at 11:55 a. m., the committee adjourned.)

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