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MINUTES OF A CALLED MEETING OF THE BOARD OF DIRECTORS OF
TARRANT COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT NUMBER ONE
HELD IN THE DISTRICT OFFICE ON OCTOBER 22, 1929, AT 3 PM

The call of the roll disclosed the presence of directors as follows, viz:

Directors: W. R. Bennett
 W. K. Stripling
 E. E. Bewley, and
 C. A. Hickman
Also: Joe B. Hogsett

At this time and place the following proceedings were had and done, viz:

1. The resignation of Director Cooke, dated September 18, 1929, was presented to the Directors for action. Director Stripling made a motion that the Directors do accept the resignation of Mr. W. S. Cooke, and that his office do be declared vacated: Further that the Directors do adopt a resolution of regret, as expressed in the written resolution presented by Director Stripling: Further, that said original resignation and a copy of the resolution do be attached to these minutes in folio, as "Exhibit A"; further, that the original of said resolution do be executed by the President and Secretary of the District, and that it be transmitted to Mr. W. S. Cooke, together with an appropriate letter. This motion was seconded by Director Hickman. Upon a vote being taken said motion and said resolution were adopted and it was so ordered.

2. Thereupon Director Hickman made a motion that the Board, under and by virtue of the authority vested in them by law, do appoint Mr. Joe B. Hogsett, of Fort Worth, Texas, who is a person in all things qualified to act as a Director of Tarrant County Water Control and Improvement District Number One, to be and to serve as a Director for said District from this day until the Second Tuesday in January, 1931, or until his successor may have been chosen and may have qualified as provided by law; further, that the term of office so provided be hereby declared to be an appointment to fill the unexpired term of the former Director, Mr. W. S. Cooke. This motion was seconded by Director Bewley. Upon a vote being taken Directors W. R. Bennett, W. K. Stripling, C. A. Hickman and E. E. Bewley voted for the motion and no director voted against the motion. The motion was declared adopted and it is in all things so ordered.

3. Thereupon Mr. Joe B. Hogsett did present his oath of office, and his bond as a director, which, upon advice of the attorneys, were declared to be in conformity to the law and said bond executed by said Joe B. Hogsett, as Principal, and the American Surety Company, of New York, as Surety, was found by the Directors to be a good and sufficient bond: Thereupon, Director Stripling did make a motion that said oath and bond do be accepted and approved; that the bond be placed of record in the Official Bond Records of Tarrant County, Texas, and thereafter deposited with the District's designated Depository for safe keeping: Further, that the original oath and a copy of the said bond do be, in folio, attached to these minutes as "Exhibit B". This motion was seconded by Director Bewley. Upon a vote being taken all Directors voted for the motion. The motion was ~~carried~~ declared adopted and it is so ordered. Thereupon Mr. Joe B. Hogsett was declared to be a duly constituted and qualified director of said District. ①

4. The minutes of the meeting of October 15 were read, approved and ordered of record.

5. Thereupon the report of Daniel W. Mead, Consulting Engineer of Madison, Wisconsin, concerning the adequacy of the plans and specifications of the District works, the safety of the design and specifications for the proposed works, and the fitness of the works proposed to accomplish the object for which the plans were adopted, together with recommendations concerning the works, was read, discussed and considered by the Directors. Hawley & Freese, the District Engineers, being present, engaged in the discussion of the report. After full consideration of this report it was the opinion of the Directors that said report did in all things substantially approve the plans and specifications heretofore formulated by Hawley & Freese, as the District Engineers. Thereupon, Director E. E. Bewley made a motion that said report be made a part of the minutes of this meeting and that the same do be so filed as "Exhibit C"; Further, that said report as so recorded do be held for future reference and consideration. This motion was seconded by Director Stripling. Upon a vote being taken the motion was carried and it is so ordered.

6. Thereupon Mr. S. W. Freese, one of the District's Engineers, did present to the Directors of the District a written request from the State Board of Water Engineers and the United States Geological Survey, concerning and confirming a prior oral request made by them to the effect that this District contribute to the funds of the State Board of Water Engineers the sum of Twenty-Five (\$25.00) Dollars per month per station for the measurement of the flow of streams as follows, viz:

- (1) Bridgeport;
- (2) Lake Worth Dam;
- (3) Clear Fork;
- (4) At the Junction of the Clear Fork and West Fork;
- (5) Village Creek.

Mr. Freese also presented the written recommendation of Hawley & Freese, concerning this matter. The written request, and the written recommendation of Hawley & Freese, based thereon, are, in folio, attached to these minutes as "Exhibit D", and are made part hereof. After full discussion Director Bewley did make a motion that the District discontinue carrying the cost of the Gauging of rain fall at various stations being now maintained at the cost of this District; Further, that the District do make monthly remittances to Mr. A. W. McDonald, Secretary of the State Board of Water Engineers, for the sum of Twenty-Five (\$25.00) Dollars per station, for each of the first named four stations above designated; That the District do not contribute to the Kennedale Station the sum Twenty-Five (\$25.00) Dollars per month, but that the District do continue to make direct payment to the Kennedale Guager, at the rate of Ten (\$10.00) Dollars per month, as is now being done; Further, that the contributions hereby provided for do be authorized to continue each month until adjournment of the next called session of the Legislature of Texas, which is now contemplated to be called in the month of January, 1930; provided, however, that the payments hereby authorized shall not, without the other and further action of this Board, be continued longer than March 1, 1930.

Director Hickman seconded this motion. Upon a vote being taken the motion was carried and it is so ordered.

7. Thereupon Ireland Hampton presented receipt of the Attorney General of the State of Texas, for the sum of Five (\$5.00) Dollars, paid for certified copies of the Attorney General's opinion approving the bonds of "Series A" of this District. This sum was paid for and on account of the District. Director Bewley made a motion that the claim be allowed and that the District's voucher do be issued to protect the same. The motion was seconded by Director Stripling: the motion was carried and it is so ordered.

8. Thereupon Director Bewley did present the request from the Texas National Bank, that it be permitted to withdraw from the pledges to secure the District certain securities, aggregating \$100,000.00, par value; also, that it be permitted to substitute in lieu of such securities to be withdrawn, other securities, aggregating \$100,000.00, par value. An itemized list and specific descriptions of the securities so desired to be withdrawn, and those to be substituted therefor, is contained in "Exhibit E", which is attached to these minutes as a part hereof. Director Bewley stated that in his opinion the securities which would be available to the District after the substitution, as requested, was adequate to secure the District within the facts and the intent of law. After full consideration of the proposal, Director Hickman made a motion that the substitution, as proposed, do be authorized and ratified; that Director Bewley, as Custodian of the Pledged Securities, do be authorized and empowered to consummate the substitution desired to be made; further, that the dual receipt executed by the Texas National Bank and by Director Bewley, as presented to the Directors, do be attached to the original bond of the Texas National Bank, as a part thereof, and to be designated as "Exhibit 6", as is provided for in said bond. Director Stripling seconded this motion; upon a vote being taken the motion was carried and it is so ordered.

9. Thereupon Director Bewley called attention to the fact that in the present status of the minutes, he and former Director W. S. Cooke were designated to act jointly, and, or individually, as custodians of pledges deposited by the Texas National Bank to secure the District against loss; further, that the resignation of Director Cooke would make it necessary to make other provision. He thereupon moved that Director Joe B. Hogsett do be constituted Custodian to supply the vacancy created by the retirement of Mr. Cooke; further, that Mr. Hogsett serve under the same conditions as applied to the prior appointment of Mr. Cooke. Director Hickman seconded this motion. Upon a vote being taken the motion was carried and it is so ordered.

10. Thereupon President Bennett called upon the Land Committee for a report concerning the purchases and leases of land. Director Hickman, as Chairman of the Land Committee, did thereupon report for approval agreements concerning land as follows, viz:

U P P E R B A S I N

(a) To purchase in fee from J. M. Morrow 537 acres of land for the sum \$25.20 per acre. Further, he reported that it had been agreed that the District would lease to J. M. Morrow, to expire on December 31, 1930, all or some part of the 537 acres so purchased, for the sum of \$1.00 per acre.

(b) To be purchased in fee from L. E. Harris 50 acres, out of the Harnsberger Tract, at the sum \$12.50 per acre.

Upon consideration of these proposals it was the unanimous opinion of the Board of Directors that the same, and each of the same, should be approved, subject to the usual conditions concerning title and possession of the land. It is so ordered.

11. There was no further business presented and the meeting was adjourned.

W. K. Stepling
As Secretary.

APPROVED:

W. M. Burnett
As President

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STEVE COOKE MOTOR COMPANY

DODGE BROTHERS
MOTOR CARS, TRUCKS, BUSES
AND MOTOR COACHES

2-5188

TAYLOR AT SECOND ST.

FORT WORTH, TEXAS

September 18, 1929.

Mr. W. R. Bennett, Pres.,
Tarrant County Water Control & Improvement,
District No. 1,
Ft. Worth, Texas.

Dear Sir:

Some months ago certain changes were made in my personal business which now requires all of my undivided time and attention, and I feel that it is no longer possible for me to remain a member of the Board of the Tarrant County Water Control & Improvement, District No. 1 and give it the attention that such an important project demands.

I am not unmindful or unappreciative of the confidence shown by the citizenship in electing me to the membership of such a large and far reaching undertaking as is involved in the Water Improvement District. And, further, I have at all times enjoyed personally being associated with the other members of this Board, and if the facts were other than as above stated, it would be a pleasure for me to continue as a member of the Board, at least until my term of office expired.

At this time the greater part of the details of the entire project have been completed by the Board, and I feel that this is the most opportune time in which to tender my resignation. I herewith respectfully tender my resignation as a Director of the Tarrant County Water Control & Improvement, District No. 1, to become effective on the 30th day of September, 1929.

While I am severing my official connection with this organization, still I trust you will feel free to call upon me at any time that I may be of assistance or aid.

Yours very sincerely,


S. J. Cooke

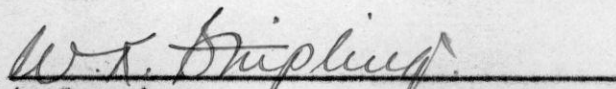
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"FORMAL RESOLUTION OF REGRET"

BE IT KNOWN AND RESOLVED: Mr. W. S. Cooke has served as a member of the Board of Directors of Tarrant County Water Control and Improvement District Number One, since January 1927; During this time he has faithfully attended the many meetings held by the Board of Directors, and has given his thought and time to the matters of the District to a degree constituting a great personal sacrifice. He now feels that he cannot continue to spare the time which would be required to further carry on his duties as a Director. In this conclusion he has been firm and it has not been possible to dissuade him in an intent to resign as a Director of this District. There is now presented to the Board his written resignation as a Director.

NOW THEREFORE IT IS RESOLVED: That the remaining members of this Board express their understanding of the urgent reasons which have impelled Mr. Cooke to withdraw as a Director of the District; further, that the association with Mr. Cooke as a Director, has in all things been most gratifying; Out of this association has grown a deep appreciation, on our part, of the sound business judgment, and constant attention to civic duty manifested by Mr. Cooke as a Director. It is with deep regret that we do now and hereby accept the resignation of Mr. Cooke. It is the desire of the Board that this resolution be spread upon the minutes of this District and that a copy hereof, bearing the respective signatures of the President and the Secretary of the District, with the District's Seal, do be furnished to Mr. Cooke.


As President


As Secretary

"EXHIBIT B"

"COPY OF ORIGINAL"

TARRANT COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT NUMBER ONE

DIRECTOR'S BOND AND OATH OF OFFICE

STATE OF TEXAS |
 |
COUNTY OF TARRANT |

KNOW ALL MEN BY THESE PRESENTS:

ON SEPTEMBER 18, 1929, W. S. Cooke did tender his written resignation as a qualified and acting Director of Tarrant County Water Control and Improvement District Number One. On October 22, 1929, the Board of Directors of said District did accept the resignation of the said W. S. Cooke, whose term of office was to have expired on the Second Tuesday in January, 1931, or as soon thereafter as his successor might have qualified.

ALSO, ON THE SAID October 22, 1929, the Board of Directors of said District, by their formal order on that day, entered of record, did, under the authority of Section 38 of Chapter 25 of the Acts of the 39th Legislature of Texas, Regular Session, appoint Joe B. Hogsett to fill the vacancy created by the resignation of the said W. S. Cooke: Said appointment was made to continue for the remainder of the unexpired term for which said W. S. Cooke was elected:

NOW THEREFORE, I, Joe B. Hogsett, of Tarrant County, Texas, as principal and American Surety Company of New York, a corporation duly authorized by the laws of Texas to enter into contracts of indemnity, as surety, do hereby acknowledge ourselves bound and firmly held to pay to Tarrant County Water Control and Improvement District Number One, its successors or assigns, the penal sum Five Thousand (\$5000.00) Dollars.

This obligation is however, a bond the condition whereof is that the said Joe B. Hogsett will well and truly perform the duties of a Directors of Tarrant County Water Control and Improvement District Number One, in accordance with his oath of office and the laws of Texas defining said duties: A further condition is that the said Joe B. Hogsett will pay over to Tarrant County Water Control and Improvement District Number One, all monies illegally paid to him out of the District Funds, as voluntary payments or otherwise and that he will not vote, or give his consent, to pay out District Funds except for lawful purposes: Further, that he will well and truly account to the District for all monies or property of the District which may come into his control as a Director

of Tarrant County Water Control and Improvement District Number One.

Upon fulfillment of the above defined conditions, this obligations shall become void; otherwise this obligation shall remain in full force and effect.

WITNESS OUR HANDS this October 22, A. D. 1929.

(Signed) Joe B. Hogsett
Principal

AMERICAN SURETY COMPANY OF NEW YORK,

Surety:
S E A L

BY (Signed) Herman Gartner
Resident Vice President

ATTEST: (Signed) W. E. Gooch
Resident Asst. Secretary.

STATE OF TEXAS

COUNTY OF TARRANT

I HEREBY CERTIFY THAT THIS INSTRUMENT WAS DULY and correctly recorded this the 23rd day of October, A. D. 1929, at 1:30 o'clock p. m. in the Deed Records of Tarrant County, Texas, in Vol. 1060, page 401.

WITNESS my hand and official seal the day and year above written.

CHESTER HOLLIS
Clerk of the County Court, Tarrant County, Texas.

S E A L

BY (Signed) Edna E. Dinkins
Deputy.

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TARRANT COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT NUMBER ONE.

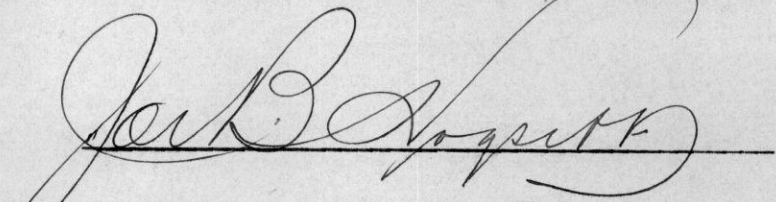
DIRECTOR'S OATH OF OFFICE

STATE OF TEXAS

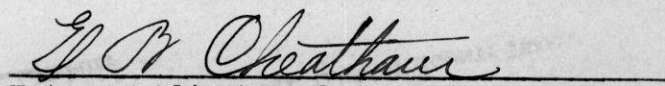
COUNTY OF TARRANT

BEFORE ME, the undersigned authority, on this 22 day of October, A. D. 1929, personally appeared Joe B. Hogsett, and he being by me duly sworn on oath does say:-

I do solemnly swear that I will faithfully and impartially discharge and perform all of the duties incumbent on me as a Director of Tarrant County Water Control and Improvement District Number One, according to the best of my skill and ability, agreeably to the Constitution and Laws of the United States and of this State; and I do further solemnly swear that since the adoption of the Constitution of this State, I, being a citizen of this State, have not fought a duel with deadly weapons within this State or without it, nor have I sent or accepted a challenge to fight a duel with deadly weapons, nor have I acted as second in carrying a challenge or aided or advised or assisted any person thus offending; and I further solemnly swear that I have not directly or indirectly paid, offered or promised to pay, contributed or promised to contribute any money or valuable thing, or promised any public office or employment as a reward to secure my appointment as a Director of said Tarrant County Water Control and Improvement District Number One. I further solemnly swear that I will not be directly or indirectly interested in any contract with, or claim against the District except such warrants as may issue to me as fees of office, so help me God.



SUBSCRIBED and sworn to before me the day and year above written.


Notary Public in and for Tarrant County,
Texas.

DANIEL W. MEAD
CHARLES V. SEASTONE
CONSULTING ENGINEERS
MADISON, WISCONSIN

proposed flood protection works on the west branch
outlines in a general way October 4, 1929

The plans have been developed. For this reason I am de-
scribing the proposed work in greater detail than would be neces-

To the Directors of the full development as now proposed.
Tarrant County Water Control
and Improvement District Number One
Fort Worth, Texas

WORKS OF THE DISTRICT

In April 1922 occurred a rainfall on the Clear Fork of
Gentlemen: River which produced the maximum flood in the Trinity

River experienced by the City of Fort Worth since its settle-
ment. I duly received through Messrs. Hawley and Freese,
Engineers for the District, your request that I inspect the
location and physical conditions which will affect and control
floods, especially the flood of 1922, have created a demand for
the design of the proposed works for your District, and make a
report:

and have, I understand, been the direct and immediate
cause of "concerning the adequacy of the plans and speci-
fications of the District works, the safety of the design and specifications for the proposed works
and the fitness of the works proposed to accom-
plish the object for which the plans were adopted,
together with such recommendations for changes as
may be * * * * * required."

In accordance with this request, I arrived in Fort Worth
on Monday, September 9, 1929, and spent the week following in an
examination of the locations of the various proposed structures
and the report, plans and specifications therefor, and in securing
from and discussing with Messrs. Hawley and Freese and their
assistants the basic data on which the proposed development is
predicated. The report made by Mr. Hawley on the general project was,
I understand, made shortly after the flood of 1922 and has been
brought down to 1927 but was made before the completion of the

plans and only outlines in a general way the basis on which the plans have been developed. For this reason I am describing the proposed work in greater detail than would be necessary if that report covered the full development as now proposed.

NECESSITY AND PURPOSE OF THE WORKS OF THE DISTRICT

In April 1922 occurred a rainfall on the Clear Fork of the Trinity River which produced the maximum flood in the Trinity River experienced by the City of Fort Worth since its settlement. Two previous floods approaching the 1922 flood in magnitude were experienced in September 1900 and in May 1908. These floods, especially the flood of 1922, have created a demand for flood relief in the City of Fort Worth and in the adjacent country, and have, I understand, been the direct and immediate cause of the creation of the District. Incidental, however, to the main purpose and perhaps quite equal in importance, are other functions which can and should be accomplished by the proposed works.

The City of Fort Worth is experiencing a rapid growth which is quite likely to continue for many years. The present water supply derived from the West Fork of the Trinity River and conserved by Lake Worth will probably be insufficient for the purpose by 1935, due to the continuous silting of the lake. The supply from Lake Worth is further constantly menaced and endangered by maximum floods which may easily exceed the spillway capacity provided in the present dam. If such an event should occur, Lake Worth would be destroyed and the City of Fort Worth would be left in serious condition with reference to its water

supply. The proposed flood protection works on the West Branch are intended to eliminate this hazard and also to prevent further silting of the lake.

A third function of the proposed District improvements is the provision of water for irrigation of certain lands in Tarrant and Wise Counties, Texas.

The necessity for irrigation is quite obvious to those familiar with the climate and the agricultural conditions of this section. While the average rainfall in this District is quite equal to that of other parts of the United States where farming without irrigation is found practicable, the irregularity of the annual rainfall in this portion of Texas, and the frequent occurrence of years and groups of years when the annual rainfall is 15% to 40% below the normal, coupled with the high evaporation which often obtains during the growing season, make the success of intensive agriculture impossible without irrigation.

The purposes which the works of the District are designed to fulfill may be summarized as:

1st. Flood protection of Fort Worth and adjoining territory.

2d. A water supply for Fort Worth equal to the probable future demands for the next forty years or more by diverting irrigation waters to domestic use.

3d. A supply of water for irrigating certain lands in Tarrant and Wise Counties.

These purposes are all of importance and, combined, probably fully warrant the expense involved, although I have not entered into this phase of the subject, this being outside the scope of my instructions.

To accomplish these various purposes, the plans proposed include:

1st. The construction of two reservoirs on the West Fork:

- A. To store water for the water supply of the City of Fort Worth and for the irrigation of certain land below the reservoirs.
- B. To temporarily retain above the stored water the excess waters of floods, and to discharge such waters automatically (in part) into the stream below only as the capacity of the channel will safely carry them away.

These reservoirs will retain the flood water from the drainage area so as to permit any flood water from the Clear Fork to pass off before any considerable flood flow will obtain from the West Fork, and will also so control the flood waters of the West Fork that they will never be excessive.

2d. The improvement of the channel of the Clear Fork and Trinity River through and adjacent to the City of Fort Worth in such a manner that it will safely pass the uncontrolled flow from the Clear Fork and from the West Fork below Lake Worth.

UNITY OF THE PLANS

It should be realized and carefully noted that while the plans made consist of three major units (viz: two reservoirs and local channel improvements) these works are nevertheless a unit in themselves and cannot be made effective except in the combination proposed, or in some other similar and equal combination. The channel improvements will not be effective nor adequate to care for the floods from the Clear Fork without the retention of the flood flows from the West Fork by the proposed reservoirs. In the same manner both reservoirs are essential to the complete flood control of the West Fork. Partial flood control would be effected by Lake Bridgeport but not adequate to the safety of the District. Eagle Mountain Lake could also be made to effect partial control

but would have to be redesigned to receive and discharge greater floods than the present design permits; and it in turn would not by itself be effective for complete control without undue enlargement. Both reservoirs are necessary for complete control of the West Fork and must be supplemented by the proposed channel improvements in order to take care of the floods from the Clear Fork. Together, these three units constitute an unusually effective whole and at a cost which seems remarkably low for the control of the intense floods to which this District is subjected.

MAXIMUM FLOOD PROTECTION NECESSARY

That the 1922 flood was the greatest that should reasonably be expected from the Clear Fork is perhaps doubtful. It is unsafe to say that any flood which has occurred was so great that it may not be exceeded, and the fact that only 67% of the rainfall ran off during the floods of April 1922 leads to the belief that with greater saturation of the drainage area a similar rainfall might result in a higher unit flow or flood peak. Such a possible increase in the maximum peak flow has been provided for in the plans prepared by Hawley and Freese, and their allowances for extreme conditions are sufficient for proper protection but not so extreme as to be economically unsound.

PROPOSED WORKS ON THE WEST FORK

Fortunately the topography of the west Fork lends itself to economic reservoir construction. It is proposed to hold back the floods from this area by storage in two reservoirs, for which sites have been found that permit of unusually safe and cheap construction.

The storage of flood waters in these reservoirs is designed to hold the floods from this area so as to permit the floods from Clear Fork to be cared for by channel improvements in the vicinity of Fort Worth.

→ [The flood protection provided for the West Fork by the plans proposed is, in my judgment, fully adequate to take care of any flood which this area is ever likely to experience.]

→ [The assumed rainfall used as a basis for the flood estimate is as great as should ever be expected, and a 100% runoff is quite beyond possibility so that an adequate factor of safety is provided by the plans.]

The plans made for the work are simple, economical, and effective. The character of the material from which the embankments are to be constructed leaves little to be desired, and the poorest of the material has been proved satisfactory by its use for over fourteen years in the earth embankments of Lake Worth. [The plans and specifications provide for first class construction and, while comparatively low in cost, are sound as to design as regards both safety and adequacy.]

TWO RESERVOIRS VERSUS ONE RESERVOIR ON THE WEST FORK

I agree with your engineers that the development of the water supply and flood protection storage in the two units proposed is more desirable than the same capacity developed in a single unit at Eagle Mountain on account of the lower cost involved, the advantage of flood protection and irrigation of the areas in Wise County, and on account of the greater safety resulting from the impounding of such great quantities of water in two units rather than in one single reservoir. Two reservoirs afford both

a greater assurance as to continuity of the future water supply of the City, and greater safety from possible, accidental or vicious destruction of the works which, in the case of a single unit, might result in a more disastrous flood than can possibly occur with the two units provided.

PROTECTION FROM THE FLOODS OF THE CLEAR FORK

It is apparent from the studies and investigations of Hawley and Freese that the excessive cost of reservoirs on the Clear Fork renders flood protection by storage on that branch out of the question, and that the provision for the flood flow of Clear Fork can best be accomplished by channel improvements at a materially less expense.

The plans for channel improvements through the City are less completely developed than are the plans for the works on the West Fork. Such plans are apparently awaiting such arrangements as your Board may be able to make with the various Railroad Companies and other interests involved. The plans, as far as developed, including levee heights and set backs, removal of obstruction and raising of bridges, seem quite satisfactory and complete. At several locations, however, the presence of railroad bridges and fills seems to complicate the channel somewhat, and an early understanding with the Railroad Companies as to how and by whom the work of providing sufficient channel capacity at such points for the maximum floods is to be done, seems desirable. Such an understanding is essential in order to determine whether or not the sums - which I understand have been set aside for such improvements, will be sufficient for the purpose.

[In general, the writer is of the opinion that the plans as outlined by Hawley and Freese are adequate to provide for the probable flood peak to be expected, including a possible increase over the flood peak of 1922 from Clear Fork as estimated by the Water Resource Branch U.S.G.S. of about 16%; in addition to which it is provided that the levees will be raised about two feet above the calculated flood flow line.]

[It should be noted that in order to make the proposed channel improvements effective, the City and Railroad bridges must be raised and lengthened as prescribed, and the channel and flood plains within the levees must be kept clear of obstruction and of heavy growth of trees and shrubs. These are matters which will need the continued future inspection and supervision of the District.]

WATER SUPPLY

[I have checked in considerable detail the calculations covering the probable water supply which can be expected from the West Fork drainage area, especially as to the low water period, from September 1908 to July 1913. I regard this period, when considered in connection with the past rainfall records, as probably the lowest period which is likely to occur although a somewhat lower period should be provided for as a safety factor. The storage provided in the plans by the proposed reservoirs near Eagle Mountain and Bridgeport will develop the normal capacity of the West Fork and provide an ample water supply for the future growth of Fort Worth for as many years as can well be anticipated at this time.]

For the purpose of irrigation, the water supply during a period equal to or exceeding in dryness the 1908-1913 period would have to be curtailed somewhat, and provision should be made in contracts for the delivery of water for irrigation purposes for the possibilities of water shortage under unusual periods of dryness, thus protecting the District from shortages beyond its control. After the completion of the proposed works, such shortages are likely to occur only at rare intervals, and only after the lands which it is proposed to irrigate are quite fully developed.

ESTIMATES OF COSTS OF THE WORK

I have not had time to check the quantities in the various structures which have been used as a basis of the cost estimates. These have evidently been carefully made, and I assume they are undoubtedly correct. The unit costs of the Eagle Mountain and the Bridgeport Dams as used by your engineers seem liberal and sufficient to meet the probable expense involved. I have, of course, no means of judging the probable cost of the land to be taken for the reservoirs nor the cost of the relocation of the railway at the Bridgeport reservoir but from the information furnished by your engineers, I judge the estimates to be sufficient to take care of the probable costs. Concerning the cost of the channel improvements through Fort Worth, I have no means of judging the expense involved as such expense will depend upon the arrangements which can be made with the various Railroad Companies and other parties interested, including the City of Fort Worth.

DETAILS

The general approval of the plans of Hawley and Freese for the work in question is necessarily based on the general plans submitted, and is made on the assumption that certain favorable geological conditions expected will obtain, and that any difference in conditions which may occur will in each case be met by proper modifications of the details.

It is obvious that as the work of construction proceeds certain minor changes in plans will be necessary to meet conditions which cannot be accurately foreseen but which must be met as they become manifest.

The only structures where any material questions might be raised are the outlet structure through which the flood discharges must take place and by which such discharge must be controlled. Here such questions as cutoffs, drainage, etc., must be modified to meet the detailed conditions as found when the excavations are completed. In this I have in mind among other things the possible necessity of introducing some form of cutoff through the sand stratum under the limestone below the outlet structures at the Eagle Mountain Dam. Certain minor modifications may be found desirable at these points which cannot well be considered here but will be discussed in detail with your engineers.

MAINTENANCE

The outlet structures of the two reservoirs on the West Fork are the critical centers of the entire project. Apparently the geological structures anticipated will be of such a nature as to permit the construction outlined in the general plans.

The enormous energies of passing floods will here be expended in the stilling pools provided, and the effects of the destruction of such energy on the sides and bottom of the unlined pool and canal leading therefrom can not be fully foreseen. It is quite probable that the passage of any considerable flood through these structures and passages will indicate betterments which will be necessary or desirable in order to prevent continuous future maintenance expense after the passage of each flood.

I feel that these structures are so important and, in a measure, so unprecedented that some model experiments would be of great value in determining to what degree protection other than that shown on the plans might be warranted at this time. The expense of such experiments would be small in view of the important information which could be obtained therefrom and the savings which might be made in the construction of the structures; and the safety which would be assured by a more precise knowledge of the action of these structures under full flood conditions would well warrant the expense involved. Such tests would give a practical demonstration that the theory and calculations on which the structure are designed are correct or should be modified somewhat, as the case may be. I do not regard such tests as necessary to safety but I do believe that they might result in a material reduction in future maintenance expenses.

CONCLUSIONS

In general, I report that I find the plans, specifications and estimates for the works of the Tarrant County Water Control and Improvement District Number One, complete and adequate

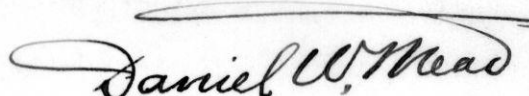
for the work to be accomplished, and I believe that they will afford a safe and satisfactory basis for accomplishing the results sought by the District and are in every way fit to accomplish the object for which the plans were adopted and the District organized.

I have recommended above certain experimental work on a model of the outlet works, which I think would be of great value to the District.

I have no recommendations for any material changes in plans or designs unless some changes might be shown necessary or desirable by the experiments above recommended. I am, however, making some suggestions for minor changes in detail directly to your engineers.

I believe the plans unusually complete and satisfactory, and in every way worthy of your confidence.

Very respectfully,



DANIEL W. MEAD

DWM:De

JOHN B. HAWLEY

M. AM. SOC. C. E.

S. W. FREESE

ASSOC. M. AM. SOC. C. E.

M. C. NICHOLS

ASSOC. M. AM. SOC. C. E.

H. R. F. HELLAND

M. AM. SOC. C. E.

"EXHIBIT D"

Page 1

HAWLEY AND FREESE

CONSULTING ENGINEERS

411-17 CAPPS BUILDING

FORT WORTH, TEXAS

Oct. 22, 1929.

WATER SUPPLY
WATER PURIFICATION
SEWERAGE
SEWAGE DISPOSAL
IRRIGATION
FLOOD CONTROL

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Directors,
Tarrant County Water Control & Imp. Dist.,
Fort Worth, Texas.

Gentlemen:

With reference to the accompanying letter from the Board of Water Engineers, we recommend that you insure the maintenance of the stream gauging station at (1) Bridgeport, (2) Lake Worth Dam, (3) Clear Fork and (4) Clear Fork and West Fork Junctions by contributing \$25.00 per month for each station until such time as the State shall have again appropriated sufficient funds to maintain these stations.

The operation of the control gates of the new dams will be based upon the measurements at the above stations and in our opinion it will be well worth the expenditure necessary to maintain a continuity in the stream flow measurements.

In connection with the above it is less essential that the District maintain at present the four rain observation stations and the river gauging station at Grand Prairie. We see no serious objection to eliminating the latter expenditure.

Respectfully yours,

HAWLEY AND FREESE

BY

S. W. Freese

SWF-CW



BOARD OF WATER ENGINEERS
STATE OF TEXAS
AUSTIN

October 18, 1929.

To the Board of Directors of
Tarrant County Water Control and
Improvement District Number One,
Fort Worth, Texas.

Gentlemen:

1. We, the State Board of Water Engineers, and the United States Geological Survey cooperating, desire cooperation from your District, in order that we may be able to preserve the continuity of the measurement of stream flows at certain points as follows, viz: (1) Bridgeport; (2) Lake Worth Dam; (3) On the Clear Fork; (4) At a point just below the junction with the Clear Fork with the West Fork; (5) On Village Creek at Kennedale.

2. The probable annual cost of each of these stations is between \$400 and \$500. In order to properly continue the field and office work necessary to obtain reliable records without interruption it is desirable that you cooperate to the extent of \$25.00 per month per station.

In case you decide to cooperate with us, you should remit at the end of each month a check in the amount necessary to cover your monthly contributions. The checks should be made payable to A. W. McDonald, Secretary, Board of Water Engineers.

3. The reason for this request is that all Legislatures from 1925 to 1927, both inclusive, have made appropriation for the measurement of stream flow in Texas, for various sums equal to, or exceeding, \$40,000.00 per year. The 41st Legislature of Texas, in their appropriation bill, reduced the sum available for this purpose to \$20,000.00. The total number of stations maintained for the year ending October 1st, 1929, was ninety-five. We regard each and every one of those stations as being highly necessary for the intelligent future handling of permits to either store water or control flood water, and for the approval of designs for works for either of these purposes in Texas. In fact there are various points heretofore omitted, which should have been included, because of lack of adequate funds. The value of stream measurements obviously lies in continuity of the measurements for a protracted time. Ten years

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is the shortest period which might be deemed to have substantial value: No records short of Twenty years could be deemed to be at all adequate. The present records have been continuously kept since 1923. If these records are to be now broken, it is obvious that we would in many cases be in the same blind condition that prevailed prior to 1923. This result we desire to avoid. It is contemplated that the called session of the Legislature, probably to be held in January, may be induced to remedy the present status. In the meantime we have sought assistance from various bodies politic and corporations in the State of Texas. To this request we are having good response in those cases in which the immediate interest exists. There are many important stations, however, as to which this immediate and individual interest does not exist. It is our hope that the fund available will enable us to maintain the stations as to which immediate interest does not exist.

4. You, at the present time, are carrying the cost of stream measurement at Kennedate and at a point on the West Fork north of Grand Prairie. In formulating the list of stations which we set out in paragraph 1 of this letter, we have omitted the Grand Prairie Station, due to the fact that it would seem more appropriate that cost of this station be carried by the Dallas Levee District, or the City of Dallas. We are also advised that you are carrying the cost of rain gauging at various points. We make no suggestion as to the maintenance of these gauging stations, but are of the opinion that rain gauging near the head waters of the Clear Fork and at the Bridgeport station may in the future prove material to your District, in order that you may be able to correlate a given rain fall with a given run-off.

5. As to the five stations which we list as the basis for our request for cooperation:

(a) Your interest in the Village Creek station is not so apparent as is true of the other four named stations. Your interest in this Station may, however, become apparent in the future. This will grow out of two matters, viz: (1) Your District may be called upon to provide levees for local protection in the Eastern part of the District. In such case, flow measurements on Village Creek and the Clear Fork will afford material basic data to affect designs: (2) It is also true that increasing the capacity of flow of storm waters from the Clear Fork through your levee area may give rise to claims that injuries had been caused by your works; In case of such claim, to have the measurement of the flow on both the Clear Fork and Village Creek might afford the only competent evidence that the supposed injury was not caused by the works maintained by your District:

(b) We think that the physical factors relating to the other four stations, when considered with reference to the works which you propose to construct, make it apparent that these records might become highly necessary for formulating plans for any alteration in your works, especially levees. We would not be understood to be of the opinion that this will become necessary, but have in mind such demonstration as may grow out of actual experiences.

(c) The variations of the measurements at Bridgeport, at Lake Worth Dam, on the Clear Fork at the point immediately below the junction of the Clear Fork with the West Fork, will have peculiar value for all time to come, in that these records would form the basis for adjusting your flood controls to protect the capacity of your own levees and also for avoiding preventable injury to points below your levee system. It is further true and under the law, and under your permit, it is contemplated that the State Board of Water Engineers shall in the future be called upon to adjust requests that your District be required to release water in storage by your District, when such water is not positively required to protect your supply and at the same time be needed to meet immediate wants at points below Fort Worth: an adequate record of stream flow might be valuable to you as showing that the potential requirements of your District required that all water in storage be retained by you. It is also true that this record could, form the basis for regulating the dispatch of flood waters.

6. All records of stream flow come to the office of the State Board of Water Engineers in Austin, at which place they are correlated. A duplicate record, is kept in the office of the United States Geological Survey, which is located in Austin. These records are also furnished, in case of necessity, to the State Reclamation Engineer. In case appropriations are available, the payment of the persons who keep these records is made directly from this office.

7. We regret to be in a position where we deem it necessary to make this request. We would not make the request save for the fact that we feel assured that your District will, in the future, have the most direct and great interest in the continuity of the record to be based on the measurement of streams at the five points listed by us. We will much appreciate your cooperation.

Yours truly,

STATE BOARD OF WATER ENGINEERS, OF TEXAS.

U.S. GEOLOGICAL SURVEY,

BY C. Ellsworth
District Engineer.

BY

C. S. Clark
Member

"EXHIBIT E" TO MINUTES OF
 OCTOBER 22,
 1929

"EXHIBIT 6"

WITHDRAWAL OF SECURITIES AND SUBSTITUTION
OF SECURITIES

ON THIS 21st day of October, 1929, the Texas National Bank of Fort-Worth, Texas, hereby acknowledges receipt of withdrawal of Securities heretofore pledged to secure Tarrant County Water Control and Improvement District Number One. Said securities are described in "EXHIBIT 2" attached to the bond of this Bank, as the District's Depository, and the same are specifically described as follows, viz:

UNITED STATES TREASURY CERTIFICATES OF INDEBTEDNESS, T. D. 4 1/2%:

<u>DENOMINATION</u>	<u>BOND NUMBERS</u>	<u>AMOUNT</u>
\$ 10,000.00	13131 to 13140, Inclusive	\$100,000.00

TARRANT COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT NUMBER ONE, as of this date, does acknowledge the receipt from the Texas National Bank of Fort Worth, Texas, to be deposited as collateral to secure the bond of said Bank as the Depository of this District, securities specifically described as follows, viz:

FEDERAL FARM LOAN BONDS, 4 1/2%

<u>DENOMINATION</u>	<u>BOND NUMBERS</u>	<u>AMOUNT</u>
\$ 10,000.00	KM310469	\$10,000.00
\$ 1,000.00	310067 to 310076, Inclusive	10,000.00
\$ 1,000.00	310431 to 310435, Inclusive	5,000.00
\$ 1,000.00	311716 to 311718, Inclusive	3,000.00
\$ 1,000.00	311815	1,000.00
\$ 1,000.00	312239 to 312284, Inclusive	46,000.00
\$ 1,000.00	312962 to 312986, Inclusive	25,000.00

TOTAL \$100,000.00

The withdrawal of securities and the substitution of securities as herein above related is in compliance with the terms of the bond executed by the Texas National Bank on April 24, 1929, as Official Depository of the District.

This reciprocal receipt is hereby designated as "Exhibit 6", and is to be attached to the bond executed by said Bank on April 24, 1929.

ATTEST:

A. Ardmore
 As *Cashier*

TEXAS NATIONAL BANK OF FORT WORTH, TEXAS

BY *W. L. Duval*
 As *Chairman*

TARRANT COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT NUMBER ONE,

BY *W. S. Smith*
 Vice President & Custodian of Securities

