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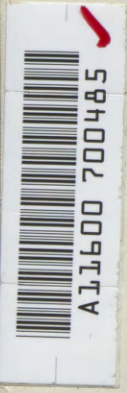
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EDEN VALLEY IRRIGATION AND RECLAMATION PROJECT

GOVERNMENT
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HEARINGS
BEFORE THE
SUBCOMMITTEE ON
IRRIGATION AND RECLAMATION
OF THE
COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS
UNITED STATES SENATE
EIGHTY-SEVENTH CONGRESS
FIRST SESSION
ON THE
EDEN VALLEY IRRIGATION AND RECLAMATION PROJECT



FARSON, WYO., OCTOBER 30, 1961
RIVERTON, WYO., OCTOBER 31, 1961

Printed for the use of the Committee on Interior and Insular Affairs



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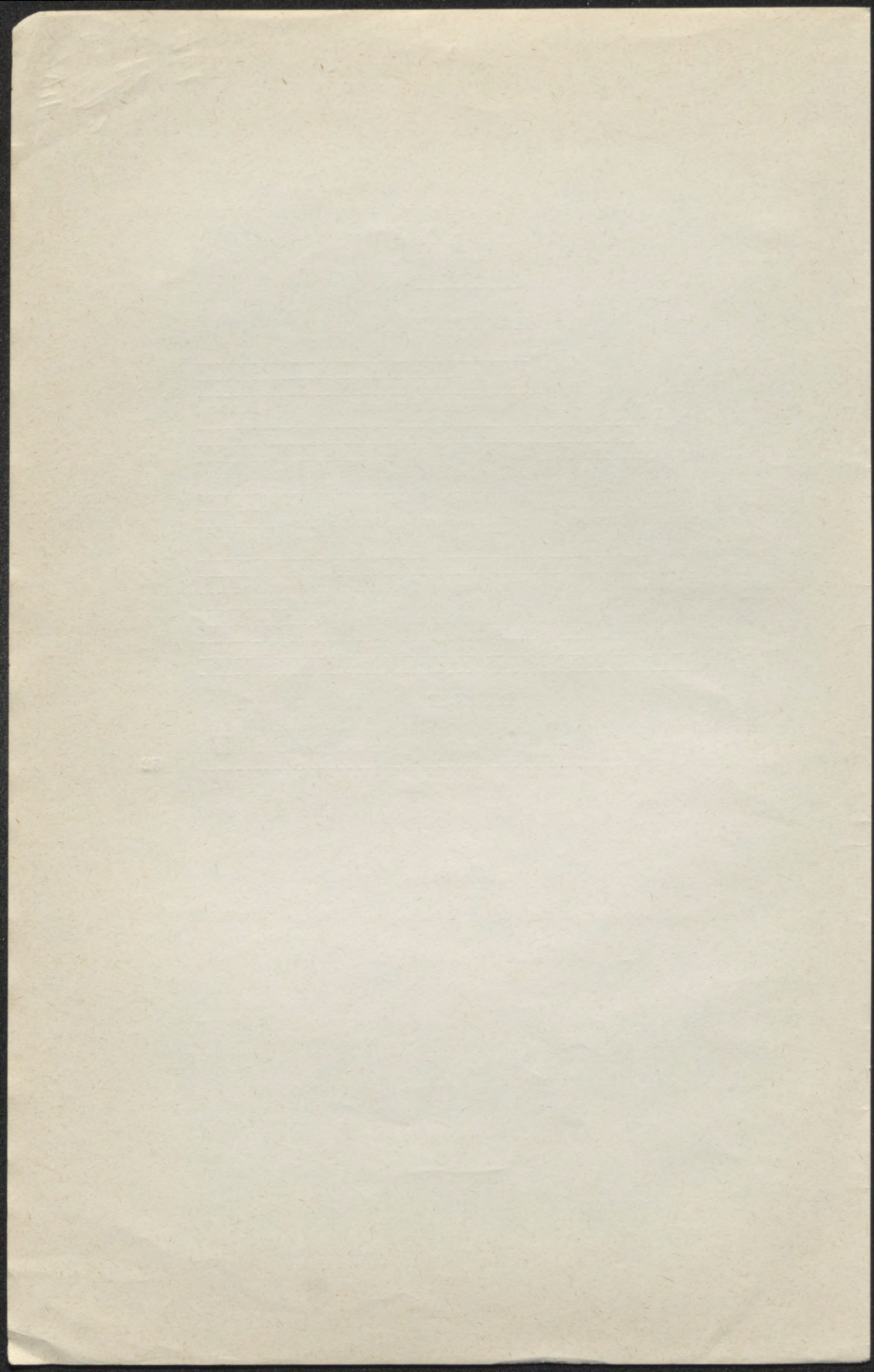
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III





EDEN VALLEY IRRIGATION AND RECLAMATION PROJECT

OCTOBER 30, 1961

U.S. SENATE,
SUBCOMMITTEE ON IRRIGATION AND RECLAMATION,
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
Farson, Wyo.

The subcommittee met at 11 a.m., pursuant to notice, in the Community Hall, Farson, Wyo.

Present: Senator J. J. Hickey of Wyoming, presiding, and Senator Quentin N. Burdick, of North Dakota.

Also present: Senator Gale W. McGee, of Wyoming, and Roy M. Whitacre, professional staff member.

Senator HICKEY. I would like to very much be associated with the moisture brought into all areas we go into, but I am afraid I can't take credit for it. We were a little worried yesterday that we would not get in here, but this morning we came right up in good shape.

First, I'd like to introduce Senator McGee, who is on the Appropriations Committee, and who is here with us participating in the hearing.

Senator MCGEE. [Applause.]

And then, later on, Senator Burdick, who is also a member of the Irrigation and Reclamation Subcommittee, which has authorized this hearing, will come in. His plane wasn't due in until 10 o'clock, and I asked someone in Rock Springs to bring him up. He will be met at the plane and brought right in.

I would like to formally open the hearing at this time, but first I would like to put in the record the basic authorization of the meeting. Reading from the testimony of the hearings before the Subcommittee on Irrigation and Reclamation, dated June 29, 1961, which was called to consider various irrigation and reclamation matters, on page 68 of that particular hearing I would like to put in the record the first request, which is as follows:

I would like to speak on behalf of the senior Senator from Wyoming, Mr. McGee, and myself on this project. Heretofore, on two separate occasions, resolutions, such as the one you have just considered for Senator Jackson, of Washington, have been put before the Congress and have been passed, and there have been deferments for 2-year periods on some rather serious problems that occurred in the third division of the Riverton project in Wyoming.

There is a similar situation in another district called the Eden Valley, which the chairman was kind enough early in my visit here to explain completely to me, and each of them, I think, get down to this proposition: That the economic feasibility of each project is really questionable.

Then on September 18, the letter directed to me from Senator Anderson says:

DEAR JOE: I have your letter of September 12 in which you suggested that perhaps the month of October would be the best time for a meeting in Wyoming on the Riverton and Eden Valley projects.

I have instructed Jerry Verkler to help make whatever arrangements may be necessary and to work with Roy Whitacre in lining up such a meeting. I think Roy would be glad to go out there and assist you at the time you deem best.

I appreciate your kind remarks and best wishes for my continued good health.

Mr. Roy Whitacre is here present, a member of the staff of the Interior and Insular Affairs Committee.

The Irrigation and Reclamation Subcommittee of the U.S. Senate Interior and Insular Affairs Committee will come to order to hear the testimony respecting the Eden Valley project. I call this subcommittee hearing to order in the absence of and under the authority of the subcommittee's able chairman, Senator Clinton Anderson, of New Mexico.

The citizens farming lands under the irrigation waters of this project have asked to present testimony respecting their irrigation and farming problems. The irrigation of these lands was evaluated by the Bureau of Reclamation of the Department of the Interior and the facilities to carry out this irrigation where it was constructed by the Bureau of Reclamation.

The farmers have expressed exceptions to the policies of the construction of this irrigation project and other policies presently being pursued by the Bureau of Reclamation respecting this project.

We are here to determine the facts associated with the exceptions in an open public hearing.

I think the first witness that has been arranged for is Mr. John Coppes.

Senator McGee, would you like to make a statement for the record before we start taking the testimony?

STATEMENT OF HON. GALE W. MCGEE, A U.S. SENATOR FROM THE STATE OF WYOMING

Senator MCGEE. I'll make no formal statement, Senator. I just appreciate the opportunity to be invited to sit with your subcommittee, because I think the initiative that you have shown on this in bringing this out to the area where the problem exists instead of our speculating on it there in Washington, some nearly 2,000 miles away, is illustrative of the importance of getting as many of these endeavors as possible directly into the community with the people who are concerned.

I think we get a feel of the question and a sense of the complexity of the problem that we can't get by reading reports alone, and for that reason I hope that your leadership in this is properly recognized. It isn't an easy thing to get an official hearing out into the home districts. The limitations are many. And in order to do this it took a great deal of effort on our part.

I think, in general, on the question, it's a matter of trying to understand some of the economic facets of the problem here in the Eden Valley, because we are marginal at the very best.

Many years ago people tried to tell us out this way that this was the great American desert, and nobody had any business living here in the beginning, and a lot of us who had faith in the Great Plains, Rocky Mountain West, have been defying that prediction ever since, but we run into marginal cases where Mother Nature locks horns with us and complicates the tasks of achieving this economic base. We believe a real intelligent policy and perseverance on the part of those who pursue it and settle there still makes it possible to see our way through.

For that reason we thought it would be most helpful if we could exchange views here, among all of us, and with the Bureau of Reclamation, in general, in order to arrive at a fair and a proper approach to the solution to the water question here in the Eden Valley. There is nothing here at all that a continuation of the water supply that we have around us this morning couldn't bail us out of on relatively short notice.

That's all the time that I care to take, Senator Hickey, so we might get on with the witness.

Senator HICKEY. Thank you, Senator McGee. I certainly appreciate the fact that you have come up here with us, because the all-important part of this function is the appropriation, and being a member of that committee, and a highly respected member of it, I think it's all important that the people have an opportunity to have the benefit of your thoughts and questions to the various witnesses.

Mr. Coppes, would you take the witness chair?

STATEMENT OF JOHN A. COPPES, FARSON, WYO.

Mr. COPPES. Mr. Chairman and members of the committee and guests; I am pleased to be given this opportunity of presenting some of our problems here in Eden Valley before your committee.

My name is John A. Coppes and I live in Farson, Wyo. I have lived in Eden Valley since April 6, 1936. I am a member of the board of directors of the Eden Valley Irrigation & Drainage District and hold the office of secretary-treasurer in this organization. I have been on the board since April 18, 1950, when the Eden Valley Irrigation & Drainage District was created by court order. I also have 416.9 acres of irrigable land in the Eden Valley project. I own and operate the Farson Mercantile Co. and hold the position of postmaster here in Farson. I wish to testify on some of the history and background of this project, and I hope by doing so you may have a better understanding of our problem here today.

In 1905 the Irrigation & Land Co. inaugurated the Eden Valley project. The original company was financed and promoted by the Farson family of New York, for whom the town of Farson is named. In 1906 the company requested the withdrawal, under the Carey Act, of 56,327 acres of land. The original project contemplated, besides the Eden Reservoir and the Eden Canals, the construction of a large reservoir at the Leckie Ranch upstream on the Big Sandy to be filled by canals from the headwaters of Little Sandy Creek and East Fork River.

Construction bonds were issued by the Eden Irrigation & Land Co. in the amount of \$800,000, and construction commenced in the summer

of 1907 and was completed in 1914 for the original project. Settlement of land began in 1908.

Through default in meeting bond obligations the project passed into the hands of a receiver, Mr. C. E. Howell, and was then purchased by the Rock Springs Water Co. This company, incorporated in 1927, carried on with the management of the project for a few years and then went into receivership. In 1932, the Wyoming Land & Water Co., a Wyoming corporation, purchased the project at a foreclosure sale for the price of \$20,000. By 1935 there was approximately 10,000 acres of land under individual ownership, approximately 9,000 acres were irrigated. In 1935, the Wyoming Land & Water Co. built a feeder canal to divert water from the Little Sandy creek to the Eden Reservoir. By 1937 the structures of the project were in such bad shape that it was apparent something would have to be done if the project was to continue to operate. The following is a quotation from a 1937 report by appraisers of the Federal Land Bank of Omaha:

Structures vital to the successful and reliable operation of the project are poor and without adequate assurance of immediate repairs and a continuous maintenance policy adopted for the future lands of the Eden project, of the Wyoming Land & Water Co., are not a safe field for loans.

It is recommended that neither land bank nor commissioner loans be made on the Wyoming Land & Water Co.'s irrigation project, at the present time, because of the structural hazards involved.

Through the efforts of the Eden Valley Farmers Association and individual farmers, the Bureau of Reclamation started to investigate the feasibility of the project. Prior to 1939 Mr. R. R. Reed was in charge of these investigations in the field and in 1940 the Bureau issued a report on the project incorporating these studies.

In 1939, Joe Smart of the Farm Security Administration, from Denver, Colo., accompanied by Marshall Smith, met at the community hall in Farson with the farmers of Eden Valley and discussed possibilities of the Farm Security Administration taking over the Eden project from the Wyoming Land & Water Co.

On May 1, 1940, the farmers of Eden Valley signed individually a resolution considering the proposal submitted to them by the United States. I would like, at this time, to present a copy of this resolution to the committee for their records.

Senator HICKEY. Without objection, it will be made part of the record at this point.

(The resolution is as follows:)

RESOLUTION

FARSON, WYO., May 1, 1940.

We, the undersigned, citizens and farmers of Eden Valley in Sweetwater County, Wyo., farming the irrigable acreage of land indicated opposite our names, have met at the community hall at Farson to consider the proposal for a Government-sponsored irrigation project to provide an assured supply of water, and drainage, for this area.

We have at various times during the past years, as a group or through our representatives, petitioned the Government for assistance in working out our irrigation difficulties. We understand that, as a result, surveys and investigations have been made by various governmental agencies and that recently the Bureau of Reclamation and the Department of Agriculture have found that a project under the Water Conservation and Utilization Act would be feasible but that before such a project is approved it is desired that the farmers in the area express themselves as to the desirability and acceptability of the project from

their point of view. We understand that the plan of the proposed project is about as follows:

The present reservoir and dam will be abandoned for storage purposes and a new storage reservoir, with a capacity of 35,000 acre-feet of which 5,000 will be dead storage, will be constructed about 3 miles upstream. Other improvements will include the rehabilitation of the present canal and lateral system and its extension to cover new lands; a feeder canal from Little Sandy Creek, an outlet canal, drainage and recovery ditches to serve the entire project as present needs are indicated.

The total cost of the project on a contract basis would be \$1,817,000, but the cost to be paid by the farmers is \$908,000, the balance being paid by the Government through participation of the Works Projects Administration. A usable value to the project of \$145,000 has been placed on the existing system and this amount will be credited on a per acre basis to lands previously taken up under the Carey Act. This means that the old lands will have to pay a lesser amount than new lands on the following basis:

Assuming 11,500 acres of old lands, the total construction charge would be \$42.74 per acre of \$1.07 per acre per year for 40 years. Assuming 8,500 acres of new lands, the total construction charge would be \$49.06 per acre or \$1.23 per acre per year for 40 years. These figures are based on total amortization in 40 years but it is actually intended that no construction charges will be assessed during the first 10 years, and the figures for the actual repayment period will thus be different.

Construction charges are interest free. All lands would pay actual operating and maintenance charges equally which are estimated at \$1 per acre per year. It is understood that these figures are estimates but are believed to be reasonably accurate.

We believe that the above proposal, supplemented by the outline of proposed operations explained by Government representatives at the meeting, is fair and the best terms under which a project can be obtained, and represents an opportunity which will be of benefit to the farmers and rehabilitate the area.

We are willing to contract for water on the basis outlined and will assist in the organization of an irrigation district or such other agency as the Government may require as a contracting agency in order adequately to secure the repayment and will agree to conform to such land use and agricultural policies as are required under the water conservation and utilization program.

Mr. COPPES. In 1941, the Farm Security Administration purchased the Eden Valley project and all Carey Act land pertaining to it, from the Wyoming Land & Water Co., for the sum of \$150,000 and began the work of maintaining and operating the project.

The plan of development outlined in the Bureau's 1940 report was approved by the President on September 18, 1940, as a Great Plains project. Under the water conservation provision of the Interior Department Appropriation Act of 1940 (53 Stat. 685) the Bureau of Reclamation was designated as the construction agency and the Department of Agriculture was held responsible for land development, operation and maintenance, and collection of reimbursable costs. It was proposed to construct the Big Sandy Dam to a capacity of 35,000 acre-feet, build a drainage system, and rehabilitate, enlarge, and extend the existing distribution system to serve 9,000 acres of irrigated land and 11,000 acres of new land. This plan proposed the abandonment of the Eden Reservoir.

Construction started on the new dam July 30, 1941; it was 16 percent completed when stopped by order of the War Production Board in December 1942. No construction work was done on any of the other project features.

Because of the great increase in prices due to the war and loss of financial support by such agencies as the Work Project Administration and the Civilian Conservation Corps, the Bureau determined that re-

authorization of the project by Congress would be necessary before construction would be resumed.

In January 1949 the Bureau made a report in which it recommended that the plan of development for the project be revised. The new plan would include rehabilitation and enlargement of the Eden Reservoir to a capacity of 22,500 acre-feet to provide water for 17,500 acres of land. Drainage would be provided and the distribution system would be rehabilitated and extended. This revised plan would not require the completion of the Big Sandy Dam.

The farmers of Eden Valley were not aware of this revised plan until Marshall Smith of the Farm Security Administration asked some of us farmers to attend a meeting called by the Bureau of Reclamation in the Elks Building in Rock Springs, Wyo. At this meeting, Mr. Larsen, regional director of region 4, Salt Lake City, Utah, and Mr. Palmer DeLong of the Kemmerer office, Kemmerer, Wyo., represented the Bureau of Reclamation. The Bureau's new plan was presented at this meeting. We objected to the new proposal by the Bureau and asked them to meet with the farmers of the Eden project at the community hall in Farson. At this meeting we based our objections as follows: To the revised plan—the Eden Reservoir is an off-channel reservoir and we would not be able to utilize to maximum use the water of Big Sandy. (1) We would lose the winter runoff. (2) The feeder canal would not have sufficient capacity to carry all of the water in high flow stages in the reservoir. (3) The capacity of 22,500 acre-feet of storage water was not enough water to irrigate 17,500 acres of land.

We contend that we signed a repayment contract with the United States in good faith for construction of the Big Sandy Dam, and if the Bureau had built the Big Sandy Dam as planned we would have had to adhere to it and that the Bureau was morally obligated to proceed with the Big Sandy Dam.

At this meeting the farmers of Eden Valley elected by ballot the following committee to represent them in future discussions with the Government: Robert Greig, Eden, Wyo.; John A. Coppes, Farson, Wyo.; G. E. Nelson, Eden, Wyo.; L. W. Grandy, Farson, Wyo.; and Ivan H. Dearth, Eden, Wyo. This committee served until the Eden Valley Irrigation and Drainage District was created by court order. The entire committee was appointed commissioners of the district at that time. Arrangements were made at this meeting to meet again with the Bureau at Kemmerer, Wyo.

At the meeting in Kemmerer, Mr. Palmer DeLong informed us that he had just talked by telephone to E. O. Larsen, regional director, in Salt Lake City, that he had instructions to inform us that the Bureau of Reclamation would proceed with their revised plan or nothing. I then asked Mr. DeLong if he would grant that there was a possibility that we were right and the Bureau could be wrong, and he informed me that he could not agree on that. I then asked him if he would suggest some official higher up in the Bureau, and he stated that we could go to the Commissioner of Reclamation or to the Secretary of the Interior. At this point we contacted our Wyoming congressional delegation and requested that the Bureau proceed with construction of the project as initially proposed in 1940.

Senator MCGEE. John, what was the date of this one, this exchange with Palmer DeLong?

Mr. COPPES. It was sometime in May; I don't have the date.

Senator HICKEY. Of 1950—May of 1950?

Mr. COPPES. May of 1940.

Senator MCGEE. 1949.

Mr. COPPES. Yes, May of 1949, I stand corrected.

Orders were received by the regional office in Salt Lake City, Utah, from Washington in July 1949 to proceed with construction of the project, as planned in 1940, in such a manner as to allow the continued use of the Eden Reservoir to the extent practical.

In August 1950, construction was resumed on the Big Sandy Dam. Plans for the dam provided for a larger structure than the 1940 plan. The larger structure would increase the reservoir storage capacity from 35,000 to 39,700 acre-feet.

On June 8, 1950, the Eden Valley Irrigation and Drainage District held an election on the repayment contract, results of which were based on irrigable acreage established by the Soil Conservation Service for assessment purpose were 9,500 acres in favor of executing the proposed repayment contract and 708 acres opposed. Immediately following the election, the district commissioners signed the repayment contract.

Bureau plans were revised during the project construction period to include limited rehabilitation of Eden Reservoir. This reservoir now has a capacity of 7,500 acre-feet. Thus, in comparison to the original 1940 plan, which provided for 35,000 acre-feet of reservoir storage capacity, the project as now constructed provides a total reservoir capacity of 47,200 acre-feet.

On January 8, 1952, the Eden Valley Irrigation and Drainage and the Bureau of Reclamation met at the Bureau office in Farson. At this meeting Mr. DeLong presented plans to construct a diversion of the Little Sandy Creek 40 miles above its confluence with the Big Sandy Creek, and abandon the diversion used at that time and wanted the district's approval on this matter. After some discussion as to the status of prior water rights on Little Sandy Creek the Board approved the point of diversion change.

On June 5, 1952, the Soil Conservation Service, through Marshall Smith, informed the district that the Soil Conservation Service had transferred the Eden irrigation system to the Rehabilitation Corp. of Wyoming and such corporation was required to transfer the system to the district and they no longer could operate the project.

At a meeting held in Cheyenne, Wyo., between the Soil Conservation Service, the Attorney General and the attorney for the district it was agreed that the transfer would be delayed to the end of the 1952 irrigation season. At that time the district negotiated an agreement conveying to the Bureau of Reclamation the Eden irrigation system and that they would operate it during the period of construction.

On May 27, 1953, a meeting was held to discuss the Little Sandy diversion. A delegation of appropriators on the Little Sandy were present, also the Bureau was represented. After a considerable discussion on water right priorities, the district rescinded their approval of January 8, 1952, on changing the point of diversion of the Little Sandy Creek and recommended that the original diversion be retained.

By the spring of 1958 it appeared evident that the water supply was insufficient to irrigate 20,000 acres. The Bureau of Reclamation and Soil Conservation Service mutually agreed to reduce the irrigated acreage to 17,500. This reduction was approved by the board of commissioners of the Eden Valley Irrigation and Drainage District. The board of commissioners have been aware of the water shortage situation since 1958, and have asked the Bureau on several occasions since that time to take another look at this project and reevaluate it. The Bureau has spent over \$8 million here with the objective to enlarge and improve this community and under the present situation they will defeat the objective they set out to achieve.

The Bureau has consistently maintained that farm irrigation efficiencies will correct most of our problems, we agree it will help. But we feel that there are other factors involved such as economics that should be considered to make this project feasible at a hearing before the Select Committee on National Water Resources, U.S. Senate held at Laramie, Wyo., October 8, 1959. A statement was presented by the Sweetwater County Farm Bureau in behalf of the Eden Valley project and I would like to offer a copy of that statement to your committee at this time.

(The statement is as follows:)

STATEMENT OF SWEETWATER COUNTY FARM BUREAU, JAMES McMURRY, CHAIRMAN

GENTLEMEN: During its annual meeting held September 22, 1959, the Sweetwater County Farm Bureau instructed a special committee to formulate and present to your honorable committee a statement setting forth the conditions now existing in the Eden project of Wyoming. Pursuant to this decision the farm bureau committee submits the following statement:

"Because of severe water shortage the past season which has caused very substantial crop and financial loss to the farmers on the Eden project, the residents of Eden Valley found it necessary to initiate steps to correct the situation with regard to the long-range water supply."

When the rehabilitation and enlargement of the Eden project was contemplated, the findings of the Bureau of Reclamation showed the water supply furnished by the Big Sandy River to be sufficient to irrigate 20,000 acres. The reconstruction of the irrigation system by the Bureau of Reclamation and the land development program carried on by the Soil Conservation Service was based on this figure which included approximately 9,000 acres then being irrigated and 11,000 acres of new land.

By the spring of 1958 it appeared evident that the water supply was insufficient to irrigate the 20,000 acres. The Bureau of Reclamation and the Soil Conservation Service mutually agreed to reduce the irrigated acreage to 17,500. This reduction was approved by the Board of Commissioners of the Eden Valley Irrigation and Drainage District.

Not all of this land has yet been put under irrigation. During the past 1959 season, less than 15,000 were irrigated. Although this is over 2,500 acres less than the total to be put under irrigation within the next year or two, a severe water shortage developed. All farms on the project suffered from the shortage but those of the older farms requiring the most water and the newly developed farm units were most severely affected.

Altitude, soil, and climatic conditions on the project combine to make this area marginal for farming operations at best. It is very doubtful if farmers settling on the new farm units will be able to succeed in producing enough to provide a livelihood and payments on their land if water shortages cause a crop shortage more often than once each 8 or 10 years. The opinion of the committee, supported by the great majority of the farmers on the project is, that the present water supply lacks about 30 percent of being sufficient for irrigation of the 17,500 acres over a long period of time.

With these conditions existing it is evident that the development of successful family farms, furnishing a satisfactory living for some of our citizens, and pro-

ducing additional food for our population—which we assume to be the objective of the Government in sponsoring this development—is automatically defeated.

In our opinion, this observation could profitably be kept in mind when plans for the Seedskaadee or similar irrigation projects are being formulated.

Attached herewith is a statement signed by over 90 percent of the present farmers on the project.

EDEN VALLEY, WYO., *September 17, 1959.*

We the undersigned farmers and ranchers of Eden Valley, find that the water requirements for irrigation in this valley have been grossly underestimated by the Bureau of Reclamation and the Soil Conservation Service. It is therefore impossible to farm on an economical basis until the condition can be corrected. Although most farms received this year approximately 90 percent of the Bureau of Reclamation's long-range prediction, we had little more than half of the water necessary.

Thomas J. Burger, Eugene Hedder, James Mines, George Shilton, John A. Coppes, Jack V. McMurry, August Hennecke, Ralph M. Stout, H. C. Brown, Joe Aguine, Joe Burton, Paul M. Olson, Fred Meyer, Vivian Swanstrom, O. E. Wright, Paul Payne, L. W. Grandy, Alva O. Brantby, Leonard J. Ingle, Magness Bauer, Mike Sporiz, Pat Murphy, Floyd Henry Eden, George D. Chilton, Vern Van Matre, Ray M. Dack, Claud R. Watterson, Mrs. John Jamieson, A. Dee Benson, Shirley Benson, Richard Y. Nelson, G. E. Nelson, Josephine C. Dearth, Emmett Griffin, Mrs. John Andrews, Paul M. Harrison, June Harrison, John J. Robinson, Nick Tomisch, Fred Badoswich, Dillwyn Ramsay, John J. Skorcz, Frank C. Mayo, Edwin J. Tomick, Mrs. Joe Tomick, Vernon J. Bluemel, Abel Vigil, John Cady, George Brown, Lois A. Brown, Ada Copley, John A. Wood, Joe M. Segura, Thelma Stout, Zeb Stout, Glenn S. Smith, Vern V. McMurry, James E. McMurry, Ruth Pellatz, Lincoln Pellatz, Leron Hunsaker, Veko Matilainness, Paul Delmastro, Mrs. Douglas P. Rolmer, Harold C. Anderson, R. R. Bell, C. A. Jensen.

MR. COPPES. On July 14, 1961, the Bureau of Reclamation presented the Eden Valley Irrigation and Drainage District with a report, "Water Supply Review, 1961." In closing I would like to comment on a couple of paragraphs in this report. The following is a quotation from page 11 of this report.

Paragraph 1:

After consideration of all factors it was concluded that based on a reasonable farm delivery averaging about 3 acre-feet per acre the dependable water supply available from project works will probably be inadequate for a project of 17,500 acres resulting in greater shortages that are considered tolerable in usual irrigation practices.

Paragraph 2:

Lining of the west side lateral to reduce seepage losses and pumping of return flow from Big Sandy Creek into the west side lateral would reduce water shortages for a 17,500-acre project to within tolerable limits.

We disagree with the Bureau on potential project improvements in paragraph 2 as a solution to our water problems here in Eden Valley. Others at this hearing will have more to say on this.

I wish to thank the committee for giving me this opportunity to testify.

Senator HICKEY. Senator McGee, do you have some questions?

Senator MCGEE. Just a few questions for clarification, John.

It is the judgment of the commissioners, then, that even with the lining activities of ditches to slow down the seepage, and the pumping of return storage water, that 17,500 acres is still too many acres for the water available?

Mr. COPPES. That's correct.

Senator MCGEE. And do they reach a position as to what acreage they think it ought to be?

Mr. COPPES. I would like to clarify this if I can, Senator. We have reached this conclusion for this reason: At no time, up to the present time, there has been more than 13,000 acres of land irrigated. There is 4,500 acres of this land that has not been irrigated up to the present time, and by the addition of their proposed lining, a pumping return flow, if we had, instead of 13,000 acres, 17,500 acres to irrigate, we would have less water than we had during the time—

Senator MCGEE. Without those two modifications?

Mr. COPPES. That's right; that's correct.

Senator MCGEE. In your judgment, if the project could be held, then, roughly to 13,000 acres with these modifications, would there be enough water to take care of the 13,000?

Mr. COPPES. There would be perhaps enough water to make it within tolerable limits, as we state.

Senator MCGEE. I should modify that, we never have quite enough water.

Mr. COPPES. There would be some years that we would be short. In other words, I'll qualify it in this respect: We wouldn't have it for every year, we will have conditions some years we are going to be short of water.

Senator MCGEE. So the real area of difference here is not on the efforts to slow down the seepage losses particularly, even though we all like to save as much of that as we can, or the return shortage water, but rather of holding down the total number of acres for the water that's available under the most optimum of circumstances?

Mr. COPPES. I would like to qualify this statement to say this: What we can see at the present time, our water supply that we can see at the present time, yes, that's our problem.

Senator MCGEE. Unless there were a new source of water or some other guarantee—

Mr. COPPES. That's correct.

Senator MCGEE. Of acre-feet that would be available—

Mr. COPPES. That's correct.

Senator MCGEE. Somewhere in the neighborhood of 13,000 feet is much closer to the mark?

Mr. COPPES. 13,000 acres of irrigated land.

Senator MCGEE. Acres, excuse me, I'm sorry. Yes. That's all I wanted to ask.

Senator HICKEY. Mr. Coppes, what, in your opinion, is the per acre requirement?

Mr. COPPES. I would say that we need $3\frac{1}{2}$ acre-feet of water per acre, somewhere along in there.

Senator HICKEY. That is without any loss?

Mr. COPPES. That's at the farm delivery point.

Senator HICKEY. Farm delivery point, $3\frac{1}{2}$ acre-feet are required to, in your opinion, properly irrigate the acreage that is available?

Mr. COPPES. That's correct.

Senator HICKEY. And I think you said that approximately 13,000 acres were now being irrigated?

Mr. COPPES. That have been up to the present time. We haven't at any one season had more than 13,000 acres under irrigation. Some years we have a little more, some years a little less, but it runs right around that.

Senator HICKEY. But under the plan there was 17,500?

Mr. COPPES. That's correct, yes.

Senator HICKEY. Have all 17,500 acres been taken up and are they in private ownership?

Mr. COPPES. I would say perhaps there is about a thousand acres perhaps that hasn't been turned into—there is some supplemental acreage to some of these farms. Some of these old farms that were already existing, that I don't think have taken up their supplemental acreage they were entitled to take, and, I believe, if I'm correct, I may stand corrected. I believe there are two farms that have not been sold, if I'm correct, two of the new farms, which is approximately 400 acres.

I would say there is about, that is, taking your State farm, and so forth, out of this project, it would be about 16,000 acres at the present time that is irrigable land.

Senator HICKEY. Was there an acreage limitation in the plan in the first instance; an acreage limitation with regard to individual ownership?

Mr. COPPES. No, sir.

Senator HICKEY. The only other question I have is what is your growing season under the normal year?

Mr. COPPES. Under a normal year, we always have a killing frost sometime in June, perhaps between, from, say, the 5th of June until the 15th of June, and then we get a frost right around the 1st of September, that's normal. I would say we have perhaps an average of 85 to 87 days of growing season.

Senator HICKEY. What are the basic crops that can be grown, considering the growing season and the soil conditions?

Mr. COPPES. We are very limited as to our basic crops that can be grown under our conditions, and it's most likely small grain and hay, alfalfa hay is predominant, and barely and oats, and they grow a few potatoes once in a while, but they are not a sure crop, and wheat is something that's very questionable in this area.

Senator HICKEY. Do you have an expression on any relationship between the crops and the limitation of acreage?

Mr. COPPES. I didn't get that question, Senator.

Senator HICKEY. Well, any relationship between the short growing season, the limitation of acreage that you have available, and the economic feasibility of the crops that are grown? For example, how many cuttings of hay can you hope to get?

Mr. COPPES. Well, you are lucky if you get two cuttings, two cuttings.

Senator HICKEY. And what basically do you sell the hay for ultimately baled?

Mr. COPPES. Well, our farm market, of course, is, according to everything else, the farmer is always griping, he's getting a little less, I will go along and agree with him. I can't help but admit there is a little difference, but our hay, at the present time we get perhaps \$25 a ton for alfalfa hay.

Senator HICKEY. And has that been reasonably steady, say, for the last 3 years?

Mr. COPPES. Yes, for the last 3 years it's probably an average. I would say \$22.50 for your average of 3 years.

Senator HICKEY. Has there been a drought condition over the last several years?

Mr. COPPES. We have an exceptional condition in the last 3 years.

Senator HICKEY. Exceptionally less water?

Mr. COPPES. Yes. We have had very little water the last 3 years.

Senator HICKEY. Has anything been done in the last 3 years since you first recognized a drought condition to relieve it in any way?

Mr. COPPES. No, sir. With only one exception, we did line some canals last fall when it was too late to do any good.

Senator HICKEY. Last fall, is that the fall of 1961?

Mr. COPPES. 1961.

Senator HICKEY. 1960 or 1961?

Mr. COPPES. 1961.

Senator MCGEE. This is 1961, you mean last fall?

Mr. COPPES. No, sir, 1961, this fall.

Senator MCGEE. We are now in winter; this isn't fall any more.

Mr. COPPES. Well, this is winter, pardon me, that's right.

Senator HICKEY. And these efforts, then, were first made in the fall of 1961, although you, as a farmer, and others of your associates here, recognized in 1958 a drought condition?

Mr. COPPES. Senator, I would like to state that every meeting we met with the Bureau of Reclamation we consistently took the position that something had to be done, that we didn't have enough water to irrigate this project and something had to be done.

Senator HICKEY. What was the Department's reply to that?

Mr. COPPES. Well, the first thing, their reply is "water efficiency." We agreed that in 1957 we had a good water year, and 1958 there was quite a bit of water used that could have been saved. I would say that there was more water, in other words, they give us all the water everybody wanted, and there was a little waste of water.

Senator HICKEY. Is it a fact, speaking of water efficiency for just a moment, that new acreage put in requires a great deal more water the first, second, and third seasons than it will after it is operating?

Mr. COPPES. On some cases, perhaps, but I think on the long run that there isn't a whole lot of difference. It just depends if you have a water table.

Senator MCGEE. Would there be any difference in your calculation, John, if we hadn't had this drought; would that have modified your guess on the acres that could have been usefully developed under the present plan?

Mr. COPPES. Senator, we take the position that regardless of whether we have had this drought, which was an exception, but we still have too much acreage for the amount of water that's available. We are looking at the long term, we are not looking at this 3-year, we want you to look at this as a long term.

Senator MCGEE. I only want to keep the record straight here. We did try to pin down a figure here a moment ago, roughly 13,000 acres, that would be feasible if water were available. I am only trying to find out if whether that 13,000 figure might be 13,500 or 14,000, or something like that, if we hadn't had 3 years of successive drought.

Mr. COPPES. The statement, as I wish to present, this is a long term, we are not taking these 3 years, this statement is on a long-term projection.

Senator MCGEE. I want to make sure that the record would show that so that this wouldn't appear to be a modification of your figure.

Mr. COPPES. We feel that at the present time the 13,000 acres is about all that we could irrigate with the worst there is, that is, to make it feasible, so we would have—

Senator McGEE. So you would still have bad years?

Mr. COPPES. We wouldn't have them so close together; we could have them maybe once in a while and maybe weather the storm.

Senator HICKEY. Mr. Coppes, you testified that you are the owner of approximately 416.9 acres.

Mr. COPPES. Of irrigable land.

Senator HICKEY. Of irrigable land. Is that about the average of the people on the project, or is it large?

Mr. COPPES. No, sir; no, sir.

Senator HICKEY. Is that larger?

Mr. COPPES. That's quite a bit larger; yes, sir.

Senator HICKEY. How many are there that have as many acres as you?

Mr. COPPES. Oh, I would say there are about 10 or 12 in Eden Valley that have 400 acres or better.

Senator HICKEY. And what is the norm; what's the average, would you say?

Mr. COPPES. Oh, the normal average, I would say, would run about 180 acres. We have some of the new farmers that have 200 acres, but some of the old farmers still have 160.

Senator HICKEY. Considering that for a moment, if the acreage is reduced, as seems to be suggested here in your statement, will the balance of the acres, the ones it's reduced to, will they be able to pay an increased per acre operation and maintenance cost that would be required?

Mr. COPPES. Well, I don't know whether I'm qualified to make that statement or not, but in my opinion we are farming a very, very marginal area, and I don't know whether these people would be able to pay any more money.

Senator HICKEY. Let's take first your own 416.9 acres, would you bear more of an operation and maintenance cost if the acreage generally was reduced?

Mr. COPPES. Yes, I would say that, if all these farmers had that much acreage.

Senator HICKEY. Let's just talk about you, and then let's go down to the 180 acres.

Mr. COPPES. I believe that I perhaps could pay a little bit more.

Senator HICKEY. How much more of a per acre charge would you say that you could operate under?

Mr. COPPES. Oh, you mean repay on your repayment contract?

Senator HICKEY. Yes.

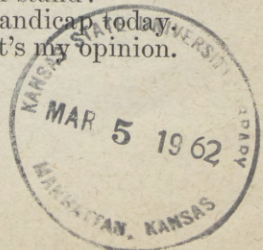
Mr. COPPES. Oh, I would say perhaps an additional \$10 an acre.

Senator HICKEY. Let's come down to the 180-acre, or the 160-acre farmer, could he bear more?

Mr. COPPES. No, sir; not in my opinion.

Senator HICKEY. He's bearing more now than he can stand?

Mr. COPPES. He's bearing more. That man is at a handicap today. Most of them don't have enough acreage to operate, that's my opinion.



Senator HICKEY. Most of the people here are cognizant of the fact that the O. & M. costs or charges are by virtue of the operation by someone other than the farmer himself; is that not true?

Mr. COPPES. That's correct.

Senator HICKEY. If the farmer himself operated it, could he reduce the O. & M. charges?

Mr. COPPES. I don't believe he will. I don't believe—as far as our O. & M. charges, I would make this statement: That we, in the years gone by, did not pay all of the costs on O. & M. charges, because some of that was charged back on construction, some of the work that was done. It was operated by the Government and some small features of it were charged back to construction costs and they were able to keep—some of the personnel were able to be transferred. When they didn't have something to do as far as O. & M. work was concerned, they would put them on the payroll on construction.

Senator HICKEY. The reduction of acreage would not materially lessen the O. & M. charges?

Mr. COPPES. No, sir; it will increase it; it will increase it.

Senator HICKEY. It will increase the per acre, but in the overall it would not reduce the total costs?

Mr. COPPES. No; it would not reduce the total costs. I don't believe so.

Senator HICKEY. Any further questions?

Senator MCGEE. Just what this says, in the light of your statement, John, that if this were all to be scaled down to, say, a figure of 13,000 acres, inasmuch as the average or more typical unit of 160 to 200 acres could not bear a substantial increase of charges, that in your judgment somewhere along the line there would have to be a writeoff on costs, or, that is, the costs would have to be borne by some other element?

Mr. COPPES. That's correct.

Senator HICKEY. If I understand your answer to Senator McGee, it's this: That we have spoken of O. & M. charges now, if you add to the O. & M. charges the development charges, or the cost of construction, in a reduced or limited acreage, that, in your opinion, some of that would have to be written off because the land could not bear it; is that correct?

Mr. COPPES. Yes. The construction charges—I would say the construction charges would have to be written off.

Senator HICKEY. You would say the entire—

Mr. COPPES. That would be an additional cost. We have a contract with the Government, Senator, that we don't pay only whatever the Secretary shall determine the feasibility of the project, and after his determination we will only pay a pro rata share of the 20,000 acres that was originally proposed in the project. We wouldn't pay any more as far as the repayment contract is concerned.

Senator HICKEY. Then it's your conclusion that if the acreage was reduced, the Secretary would again have to take a look at the contract to make a more equitable allocation of the costs?

Mr. COPPES. That's correct.

Senator HICKEY. I have no further questions.

Thank you, Mr. Coppes; we appreciate your testimony.

Mr. Paul Payne.

STATEMENT OF PAUL PAYNE

Mr. PAYNE. Mr. Chairman, members of the committee, and guests, my name is Paul Payne. I own a farm under the Eden Valley project containing 560 acres with water rights for 441 acres and I have lived in Eden Valley for 26 years. I wish to testify to the long-range water shortage as it concerns the water users.

Due to the high altitude, short season, type of soil, and the limited crops we can raise, farming in this area is marginal even in the best years.

Therefore, it is very important to the water users of Eden Valley that every effort be made to hold the short years of water to as few as possible. There has been a lot of talk and discussion as to the efficient use of water on the Eden project in the past few years.

Due to the different types of soil under this project, it is readily admitted that some of the land needs more water to produce a crop than other land.

I think it would be better to speak of it as land requirements instead of efficient use of water, always keeping in mind to be as efficient as possible.

I know of no one more qualified to say how much water a given piece of land requires than the water user who has been irrigating this land. For this reason I have contacted several of the farmers in the valley to find out the amount of water they feel is necessary to produce a crop. I talked to 23 water users. This is not all the water users in Eden Valley. However, it is a good cross section of the water users. Some are from the wetter places, some from the dry places, and some from average places. Their requirements range from 2½ to 5 acre-feet of water delivered at the farm turnouts. However, the average of all water users contacted was 3½ acre-feet delivered at the farm turnouts. This seems to me a good way to arrive at the amount of water required.

It is agreed by a large majority of water users under the Eden project, that as the condition now stands there will be too many years when we will be short of water, and that something must be done to correct this condition.

The problem is, not enough water or too much land under irrigation. To correct this problem we will need more water or reduce the acres. Testimony will be presented in this hearing to the effect that the acres should be reduced so there will be the required amount of water in the majority of years.

If something is not done as to the long-range water shortage, I believe the problem will solve itself by farmers having to move out due to not enough water to irrigate their land. This is certainly no way to solve the problem.

I would like to testify as to what has been done by the water users and different organizations in regards to the long-time water shortage.

The latter part of 1957 and the early part of 1958, there was an agreement between the Bureau of Reclamation and the Soil Conservation Service that there should be a reduction in acres from the original 20,000 to 17,500. This agreement was presented to the commissioners of the Eden Valley Irrigation and Drainage District and was approved by the commissioners. It was agreed that there was likely to be a shortage of water.

Several of the water users wrote letters to our congressional delegates, and the reply to these letters were very encouraging.

In 1959, the Sweetwater County Farm Bureau presented a statement to the Select Committee on National Water Resources along with a petition signed by 90 percent of the water users that there definitely was a long-time water shortage.

In 1960, a water procurement committee was appointed to work with the commissioners of the Eden Valley Irrigation and Drainage District to help find ways to relieve the long-time water shortage. The water procurement committee met with the Bureau of Natural Resources at Cheyenne, Wyo., to see if they could be of any help in regards to the long-time water shortage.

I have not presented exact dates as to these meetings and hearings, however, they are a matter of record. Everyone was interested at these meetings and no doubt done what they could to help us with our problem.

It has been 4 years or more since it was known by the water users and the commissioners of the district that there was a long-range water shortage.

We believe this hearing is a step in the right direction to the solution to our problem.

I present for the record the names and addresses of the water users contacted and the amount of water needed to produce a crop.

	<i>Acre-feet</i>
Lynn Grandy, Farson, Wyo.....	2½
Gus Hennecke, Farson, Wyo.....	3½
Paul Payne, Farson, Wyo.....	3
Gus Nelson, Eden, Wyo.....	5
R. W. Greig, Eden, Wyo.....	2½
Tom Barger, Farson, Wyo.....	4½
Al Brantley, Farson, Wyo.....	4½
Eugene Hodder, Farson, Wyo.....	4
Jim Mines, Farson, Wyo.....	4½
Tom Delmastro, Eden, Wyo.....	3½
Joe Burton, Farson, Wyo.....	3½
Veko Matilainen, Farson, Wyo.....	3
Ora Wright, Farson, Wyo.....	2½
A. W. Winters, Eden, Wyo.....	4
John Woods, Eden, Wyo.....	3
Floyd Henry, Eden, Wyo.....	3
A. Dee Benson, Eden, Wyo.....	4
Claude Watterson, Eden, Wyo.....	4
Fred Meyer, Farson, Wyo.....	3
Gerald Stout, Farson, Wyo.....	3
Vern Van Matre, Eden, Wyo.....	3
Zeb Stout, Eden, Wyo.....	3½
Mrs. John Andrews, Eden, Wyo.....	4

NOTE.—Average acre-feet required, 3½.

Senator HICKEY. Senator McGee, do you have some questions?

Senator MCGEE. Only one point to make sure that the record shows the point without confusion, and that is that the alternative to either producing more water, or utilizing less land for the available water, is to let the situation solve itself, namely, by the farmers now here going broke. And if I interpret your statement correctly, this would almost certainly mean that the farmers with the smallest holdings would probably be the first to go, is that true?

Mr. PAYNE. Well, I don't know that that would be necessarily true; it might be.

Senator McGEE. That is, in terms of economic staying power, lasting power, there would be no difference in your judgment between a farm that has 400 plus acres for irrigation now and one that has 160 acres?

Mr. PAYNE. If you are short of water, why, you would be short on 400 acres just the same as you would on 160. The situation is you have got to have water in order to make it.

Senator McGEE. Yes. I had understood that there was, in terms of any operation, a fixed charge, a fixed cost of staying in business that was a little bit invariable whether you had 400 or 200, and therefore, it might be a little more difficult for the smaller landholders to stay as long under adverse circumstances than the larger ones.

Mr. PAYNE. It might be a little more difficult for them to stay.

Senator HICKEY. Mr. Payne, you spoke of the altitude, could you give us a normal figure on the altitude in the general area?

Mr. PAYNE. It's about 6,500, something like that.

Senator HICKEY. And that's the general altitude?

Mr. PAYNE. That's the average of it, I'd say.

Senator HICKEY. Would you care to comment on this recommendation made by the Bureau in March 1961, "It is recommended that lining of the west side canal and the construction of a pumping plant and canal to deliver return flow from Big Sandy Creek to the west side lateral, be undertaken as Eden project features," what would the effect of that recommendation be?

Mr. PAYNE. Well, I personally don't think that that would solve our problem at all. I agree that any amount of water that could be saved would help, such as lining the canal, and even a pumping plant, but I don't think that's enough. I think we need more water than that.

Senator HICKEY. You think that sufficient water would not be provided with that recommendation to irrigate the project as now set up?

Mr. PAYNE. Right.

Senator HICKEY. But if it were reduced, and these recommendations followed, would there be some assistance?

Mr. PAYNE. Yes. Any amount of water that would be saved by seepage, or pumping, or anything, but the Board doesn't agree that it is feasible, especially the pumping plant, they just don't seem to think that that is right.

Senator HICKEY. Do you know anything about the quality of the water that would come from this area?

Mr. PAYNE. You mean from this pumping plant?

Senator HICKEY. Yes.

Mr. PAYNE. Well, according to the Bureau's report, I believe they say it contains some salt, but it could be used if it was mixed with the irrigation water; it could be used.

Senator HICKEY. Any other questions?

Senator McGEE. No.

Senator HICKEY. Thank you, Mr. Payne.

(Whereupon, Senator Quentin N. Burdick entered the community hall.)

Senator HICKEY. I would like to introduce Senator Burdick from North Dakota who has just arrived for the hearing. [Applause.]

Senator MCGEE. Mr. Chairman, may I add that we have tried to make him feel at home by providing him with North Dakota weather.

Senator HICKEY. Mr. Thomas Barger.

STATEMENT OF THOMAS J. BARGER, FARSON, WYO.

Mr. BARGER. Mr. Chairman, members of the committee and guests, my name is Thomas J. Barger. I am a farmer and farm owner on the Eden project. I purchased one of the new units here 4 years ago.

I would like to talk about the amount of water that we may expect under present conditions and the amount we actually need. We differ with the Bureau of Reclamation considerably in both cases.

For about 3 years now the Bureau has made repeated claims that we would receive at the farm 3 acre-feet per acre during a normal season. The facts do not support this. We know that under present conditions we would receive at the farm at most only about 2.3 feet in an average year. This is about 60 percent of our requirement.

To support their claim as to the water we will receive the Bureau has records of the amount of water turned into the canals and the amounts delivered. It is these amounts delivered that are in error. They are at least 20 percent high for the following reasons:

1. During recent years, we have had a very bad weed problem in our canals and ditches. These weeds are constantly plugging turn-outs. At times this can reduce the flow by half. Oftentimes the flow is reduced by 20 to 30 percent. The Bureau allows no credit for this. If a farmer orders 5 second-feet this is exactly what he is charged for. I know from actual measurements that my flow has been reduced at times by one-third. We do not have any figures on the overall reduction in delivered water because of weeds, but a reasonable estimate would be 10 percent and is probably more.

Now the reason I bring up this weed problem is that they have a direct bearing on the amount of water we can expect in the next 50 years. The Bureau has records of water delivered in only the last 5 or 6 years and they are using these figures to prove the percent of water from our watershed that they can deliver.

2. The second reason the delivery figures are not accurate is because of fluctuating canal levels. It would appear that these fluctuations would even out over a period of time, but this is not the case. The ditch riders normally check each turnout in the morning when the canals are usually at their highest crests. This may be due to less evaporation during hours of darkness and consequently higher flows in the morning hours. The weeds also contribute to erratic flows. The main reason the canals fluctuate is probably because the Bureau has been very conscientious during the last 3 years about not turning in too much water into a canal and having waste go out the end of the canal. They have done this to conserve water and they have saved water—by simply not delivering the amount charged.

3. The third reason is because the flowmeters used to measure out water to the farms actually overregister. These flowmeters measure only the speed of water and when used in conjunction with prepared tables indicate the flow rate in cubic feet per second. These are recog-

nized as the least accurate but they are less expensive to install than other devices. There are about 8 or 10 of these meters that are used to measure the flow at all orifice-type turnouts.

We have measured the flow with a weir and a Parshall flume at only one turnout but since all turnouts are measured by only a few flowmeters, it is reasonable to assume there may be errors in other turnouts. If only one-third of the turnouts are overregistering by 10 percent, which is true in this one case, then this is 1,700 acre-feet of water we are charged with but not receiving.

This condition was brought to the attention of Bureau officials. They took the position that if they corrected this one flow they would have to check and correct all the turnouts—which is true, of course—and that this would cost too much money, which is not true.

We don't know exactly how much water we are being charged for and not receiving, but a reasonable estimate in consideration of foregoing factors would be that we are overcharged at least 20 percent. This means we could expect only about 2.3 feet of water in an average year.

During the last 3 years, which we know were subnormal, if all the land here had been under irrigation, we would have received slightly over 1 foot of water each year, on the average. For most of the land in this valley this means less than half a crop. Which in consideration of marginal economic conditions is an impossible situation.

In their 1960 report, the Bureau reported that the 1959 runoff was 73 percent, or about three-fourths of normal. That same year we irrigated only three-fourths or less of the land here. In the same report they said we would get 3 feet of water in a normal year. It seemed to us that if your water available was three-fourths of normal and you were irrigating three-fourths of the land, then your water supply should be normal, or 3 feet. Instead we received 2 feet. We pointed this out to authorities during the next 12 months, but we received no comment until the 1961 report came out. In this report they reduced the 1959 runoff from 73 percent to 60 percent. Even refiguring on 60 percent, we should have received 2½ feet and only received 2 feet, or even less.

Again it is obvious that we are being charged for water that is lost in the canals.

Now the Bureau claims that their canal losses here are 18 to 19 percent. In this connection I would like to quote a statement from an authority. The author of this statement is George D. Clyde, of Utah, who, among other things, has spent 22 years with the Irrigation Department, Utah University, and a number of years with the Soil Conservation Service.

Out of 125,000 miles of irrigation canals and laterals in use in 17 Western States in 1939, all but about 5,000 miles, or 4 percent, were unlined, untreated earth channels. Such channels are the cheapest to construct, but they are expensive to maintain, and they permit seepage losses often amounting to 70 percent, or more.

We have here canals that are essentially unlined, although 50 percent of the main canal has been filled with what clay materials they could find in the area and this has been machine compacted. This, no doubt, reduces losses somewhat, but does not prevent all loss and does nothing for evaporation losses.

We know also that the average loss throughout the West in these canals is about 40 percent.

Now the Bureau does say that there has been excessive losses from the reservoir and I would like to quote from their 1961 report.

Actual losses from the Big Sandy Reservoir were determined by comparing the measured inflow with measured releases and spills, giving consideration to changes in reservoir content. Losses determined in this manner were found to exceed by 110 percent the average annual losses of 3,600 acre-feet estimated in the definite plan report. The greater losses appear to result from reservoir evaporation rates that are much higher than estimated from the definite plan report. The estimates were based on altitude evaporating rates in the immediate vicinity of the reservoir. Several recent years of pan evaporation rates at Farson indicate that the formerly estimated rates were too low.

While the Bureau acknowledges that there has been excessive evaporation losses from the reservoir they fail to notice that this same force that evaporates water from the surface of the reservoir also can evaporate water from the surface of our canals and laterals. The combined surface area of all our canals and laterals is actually greater than the surface area of both the reservoirs. Yet they claim that the loss from the canals is essentially the same as they estimated in the original plan of 1953.

All this adds up to the fact that the canal loss is larger than stated by the Bureau and the farmer is being charged for the loss.

I would like to bring up now my second topic which is how much water we need. In determining how much water is required for a given area, you first determine the plant consumptive use and then the expected onfarm irrigating efficiency. The Bureau has set the plant consumptive use for this area at 1.31 feet per season. We have no facts to dispute this figure other than the discovery by the Bureau that evaporation here is abnormal. No doubt the Bureau took this rate from established tables. Since there is abnormal evaporation here then the transportation rate must be greater and the consumptive may be higher than the 1.31 reported.

In regards to the onfarm irrigation efficiency, we feel the Bureau is considerably "off base"—in fact, they are not even in the same ball park with us. Until about a year ago, they claimed that we should obtain an efficiency that was 70 percent above the average for the Western Mountain States. Now they have lowered this expected efficiency until it is only 25 percent above the average. From this we think we are making progress but not fast enough, nor far enough.

I would like to quote again from an authority on this subject, George D. Clyde; Utah:

Tests made on Utah farms over a 5-year period indicated that water application efficiencies averaged 34 percent for valley-land farms.

For the purpose of my discussion, I have taken the 34 percent as a reasonable expected efficiency for this area although there is evidence that it probably should be lower.

I would like to discuss briefly the conditions we have here that lead to poor efficiency.

1. Soil texture. Most of the soil here could be classified as a coarse sand with low water holding capacity. This requires frequent irrigations and with each irrigation there are some losses that cannot be prevented.

2. Type of irrigation. About one-half of the land on this project is leveled for border-dike irrigation and this is one of the more efficient types. However, the slopes within the fields are uneven; the border lengths in a given field may vary from 50 feet to 1,300 feet and this contributes to poor efficiency.

About one-third of the land here is irrigated by contour ditches. It must be irrigated this way because of rough terrain and irregular slope. Some could be revealed to good advantage and probably will be in the future, but most cannot be leveled because of thin topsoil. The contour ditch method of irrigating is one of the least efficient methods.

3. Permanent structures. By and large, we are poorly equipped with the proper tools to do a good job of irrigating. On only a few hundred acres in this valley do we have the land fully equipped with permanent checks in the ditches and permanent turnouts onto the land. On probably something close to half of the land here the farmer uses no other tools than a shovel. Very much like the land was irrigated here 50 years ago. These are not conditions that contribute to high efficiencies. They do just the opposite.

4. High wind factors and low humidities: We have winds here practically every day during the summer. The Bureau has pointed out that we have an extraordinary evaporation force here. This force works against us on the farm as well as on the reservoir and contributes to low efficiencies.

5. Labor shortage: Labor is a very scarce item here. No doubt if each farmer had two more irrigators to help him he could improve his efficiency somewhat. But even if the manpower was available, economic conditions do not justify the cost.

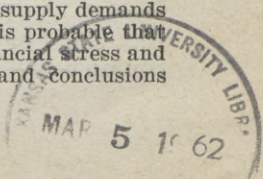
For these reasons we feel that something like 34 percent on-farm efficiencies would be all that could now be expected in this area. In time, of course, this could be improved. We have land that needs re-leveling and we have a large need for better on-farm control facilities. It is possible that in 10 or 15 years we could raise our efficiencies to something like 40 percent, but this will not be an overnight job.

If we consider a consumptive use of 1.4 and an efficiency of 34 percent, this gives a requirement of about 4 feet delivered to the farm. More than half of the land here will require that much or more, but in consideration that there is land here that will require less, and in consideration of the fact that we can raise our efficiency, then we feel an average of $3\frac{1}{2}$ feet would be the minimum possible.

Stated in terms of acreage and from the available supply of water, this means we can irrigate about 13,000 acres. This represents a permanent reduction of about 7,000 (or one-third) acres, from the original planned 20,200 acres.

In summary, I would like to quote a sentence from one of the best known authorities in the irrigation field, which expresses my feelings on this project better than I could. This is from the book "Irrigation Principles and Practices" by Israelson and was written more than 10 years ago.

The accumulation of dependable information concerning water supply demands intelligent and painstaking endeavor and continuous effort. It is probable that inadequate water supply has contributed most to the years of financial stress and ultimate failure of many irrigation projects. Overoptimism and conclusions



based on insufficient knowledge of watershed yield have been common and expensive follies among many leading western citizens in both private and public places. Overestimates of water supply for various projects are frequently reflected in the small areas of land actually irrigated as compared to the area of land irrigated in the original project.

I believe we have here a simple case of history repeating itself.
Thank you.

Senator HICKEY. Senator McGee, do you have a question?

Senator MCGEE. First, the case that you make suggesting that the users here are paying for water that they never received, would you not regard this as a fundamental difficulty or problem as far as the possibilities of the success of the project is concerned?

Mr. BARGER. No, sir.

Senator MCGEE. This is a matter of negotiating an adjustment on whatever would seem to be fair on that?

Mr. BARGER. I only brought that out in the first half of my testimony here to show that, try to show, that the Bureau has these records of water delivered and they are not accurate, that's all; that's the only reason.

Senator MCGEE. My second question to you, how much do you think that an expanded program of ditch lining, and perhaps, as they are learning more now, as we have reason to believe they are, of new chemicals, such as hexadeconal to slow down the evaporating process, how much might this contribute toward strengthening the potential water supply; do you think there is enough there that might make it possible to revise, let's say, your figure, also, of 13,000 acres?

Mr. BARGER. Are you referring to something to prevent evaporation from the surface?

Senator MCGEE. That's right.

Mr. BARGER. Well, Senator, that's entirely possible, but I don't think it would affect my figures here in the least. We here in this valley aren't in a position to go along with these experiments. As I understand, that's still in the experimental stage.

Senator MCGEE. Very much so. I was wondering, you have attached a great deal to the problem of evaporation—

Mr. BARGER. Yes, sir.

Senator MCGEE. As a factor here that produced these miscalculations on the amount of water that really was available to be applied to the land, and I was raising that only by way of soliciting your judgment as to whether, in this direction, we might find some little more water than is available now for application on the land.

Mr. BARGER. No, sir. It's possible they will find something to slow this evaporation, but I would doubt very much that it would make any material difference in the acreage that could be irrigated here.

Senator MCGEE. What about ditch lining?

Mr. BARGER. That would help some. Now, this project, the Bureau is suggesting now, it cost half a million dollars to line just one part of our main system here, the west side lateral, and the way I figure it that would add about one-tenth of a foot to each farm. Under the present conditions we are going to get about 2.3, maybe, so we would get 2.4. As I see it, it wouldn't make any difference whether they line that canal or not, the net result to us would be all the same, we just couldn't—

Senator MCGEE. It's a fair summation, then, of your position, merely so that the record will be abundantly clear on this, that there is no appreciable new source of water in sight—

Mr. BARGER. No, sir.

Senator MCGEE. To change the water shortage picture, even in a moderately good year; that the solution lies in the direction suggested by Mr. Payne and Mr. Coppes of acreage reduction in the project?

Mr. BARGER. Absolutely, that's the only feasible way. It costs millions to bring in more water here; it would be out of the question.

Senator MCGEE. That's all I have.

Senator HICKEY. Senator Burdick?

Senator BURDICK. If I understand your testimony, you believe there is enough water for 13,000 acres?

Mr. BARGER. Yes, sir, approximately.

Senator BURDICK. How many acres do you have in the project now?

Mr. BARGER. In the original project, the permanent plan there is 20,200. Now, the Bureau has made a temporary reduction to 17,500.

Senator BURDICK. Was 17,500 in use just this last year, this past year?

Mr. BARGER. No, sir, all of that hasn't been irrigated.

Senator BURDICK. How much has been irrigated?

Mr. BARGER. About 13,000, or a little more or less.

Senator BURDICK. Then 13,000 has been the maximum acreage ever irrigated under this project?

Mr. BARGER. Yes, sir.

Senator BURDICK. Has there been water enough for 13,000 acres?

Mr. BARGER. No, sir. Actually there has been a shortage under those conditions in the last 2 years. Now, I suggested 13,000, but we would still have shortages, even with 13,000 acres.

Senator BURDICK. You think over a period of years, though, that it might average out a sufficient amount of water to take in—

Mr. BARGER. I believe it would. I couldn't be sure of that. It depends on, if you are going to reduce the acreage here, it depends quite a good deal on which acreage you take out. We have some acreage here that we could very effectively use 5 feet of water in a season, and other acreage it takes less, it's older land, and 2½ feet would probably be sufficient. There is some subbing that takes place in these areas where the water is held and it doesn't get away from you in the coarse sand. It depends on which of those acreages you retire, and also it might be a possibility if you took out the land by blocks you could also eliminate a proportionate share of the canal system, which we are probably losing about 50 percent, I believe we are losing probably something like 50 percent in storage and canal losses together.

Senator BURDICK. What other solution is there? You say ditch lining won't make a substantial difference?

Mr. BARGER. Just retire about a third of the acreage here.

Senator BURDICK. Is there any possibility of more water?

Mr. BARGER. Yes, sir. The Bureau has made some studies, and I think it's about \$3 million, they can bring in some water from outside our watershed. Three million dollars, it just doesn't seem reasonable, and even that supply, they say, is 10,000 acre-feet, and even that

wouldn't give us the $3\frac{1}{2}$ average we believe we need as a minimum, and the cost of—

Senator BURDICK. That wouldn't give you more than was needed for 13,000 acres?

Mr. BARGER. For the 17,500. That still wouldn't give us $3\frac{1}{2}$ acre-feet delivered to the farm.

Senator BURDICK. Is this moving water from one watershed to your watershed?

Mr. BARGER. Yes, sir.

Senator BURDICK. Is there any way that your own watershed could be, the efficiency of your own watershed could be improved gathering water?

Mr. BARGER. I don't believe it would be practical. Somebody is suggesting seeding clouds, cloud-seeding program, but I think that's very experimental and doesn't offer much promise for any area in these States.

Senator BURDICK. Then is it a fair statement to say that the solution you recommend is reducing acreage?

Mr. BARGER. Yes, sir; that's the only practical one at all.

Senator BURDICK. That's all.

Senator HICKEY. Mr. Barger, just a few questions about your background.

No. 1, how many acres do you farm?

Mr. BARGER. I have irrigated acres, 237. Now, my original farm that I bought 4 years ago was 202 and I purchased an additional 35 acres.

Senator HICKEY. You came about 4 years ago on a new unit, is that correct?

Mr. BARGER. Yes, sir.

Senator HICKEY. You have now increased it to 237 acres?

Mr. BARGER. Yes, sir.

Senator HICKEY. What were you doing prior to that?

Mr. BARGER. I have been farming since I was 16, I'm 43 now, and I put a few years in the service, and I had 1 year at the University of California.

Senator HICKEY. Are you retired from the service?

Mr. BARGER. Yes, sir.

Senator HICKEY. And what was your rank at the time of retirement?

Mr. BARGER. Lieutenant colonel.

Senator HICKEY. In what branch?

Mr. BARGER. Air Force.

Senator HICKEY. Would you care to say—if you don't, if it's confidential, please say so—would you care to say what your total investment was in this unit when you came in, out-of-pocket money?

Mr. BARGER. It is approximately \$40,000 right now, of which most is borrowed from FHA.

Senator HICKEY. And you have invested that in the 237 acres?

Mr. BARGER. Yes, sir. And I still don't have near the improvements I should have.

Senator HICKEY. Speaking of this \$3 million proposal of bringing in water from other areas, out of another watershed, if our mathematics are right, that would be about \$750 an acre increased cost of acreage.

Mr. BARGER. \$3 million divided—I suppose so.

Senator HICKEY. And what is your opinion with regard to whether or not acreage, such as yours, could bear such a cost?

Mr. BARGER. Oh, that would be out of the question entirely. It already takes us \$200, \$300 an acre to just set up a minimum operation here, and then that's a questionable situation, even with ample water here, Senator. It is still a question of whether these are feasible. In fact, my private opinion is they are not, but I can't say from actual experience. Whoever pays, puts in \$600 or \$700 or \$800 more an acre here is entirely unreasonable even if the Government pays 99 percent of it.

Senator HICKEY. Would you care to place a per-acre value, say, on your own land today?

Mr. BARGER. Well, according to what I have invested, and my work, it would—well, it would probably be around \$250 an acre.

Senator HICKEY. Could you sell it for that amount if you were to put it on the open market today?

Mr. BARGER. No, sir. There is just not any buyers, or would be any buyers for this area, I'm sure.

Senator HICKEY. Do you know of any sales made in the area of recent date, say, within the last year and a half, and what the per-acre price was?

Mr. BARGER. There was at least one farm, I think, in the last year and a half here, but I don't know what the price was.

Senator HICKEY. Could you say whether or not it approached \$250 an acre?

Mr. BARGER. My guess would be, it would probably be around a hundred dollars an acre.

Senator HICKEY. If the acreage is reduced, as suggested, will the balance of the acres be able to pay the increased per-acre operation and maintenance costs?

Mr. BARGER. Well, it would be a burden on them when they are already overburdened with fixed expenses. In consideration of the market, in this area, we are just about as far from the market in the United States as you can get. We have marketing costs exceeding most areas. I suppose it would be better to pay an extra O. & M. than to have the present situation here as only a half a supply of water, a little more than half.

Senator HICKEY. Could you tell me what the O. & M. charge is now?

Mr. BARGER. Yes, sir. We have been paying about \$1.35 for the last 3 or 4 years, per acre.

Senator HICKEY. Mr. Coppes, with approximately twice as much land as you have, suggested that he could stand an increase. What increase would you think perhaps your acreage, if any, could stand?

Mr. BARGER. Honestly, I don't believe it would stand any increase, but it would probably be better to take some increase than the present water situation.

Senator McGEE. May I ask for a clarification on that, Joe?

You did indicate, Mr. Barger, that given the present situation, which is desperate, that it would be better to accept an increase in O. & M. charges, obviously, I would assume, because your economic base would be stronger than it is at any time?

Mr. BARGER. Yes, sir.

Senator McGEE. Which would seem to suggest that there was some breaking point there where you could accept increased charges and still be a little better off than you are now, and I think perhaps that was the point that was being sought after here. You realize that it might not be desirable, it would be better to have no new charges added to it, but we are trying to find if there was a dividing line, in your mind, where there would be enough difference to make it matter.

Mr. BARGER. Yes, sir. I have thought about that very thing, but the small farms here are much too small, I'm sure of that. Anyone that stays is going to have to go over the 200 acres, somewhere between 300 and 400, to make it here at all, and perhaps if the average farm remaining then is between 300 and 400 acres, then it's entirely possible that the extra O. & M. charges could be payable.

Senator McGEE. I wasn't thinking of all the extra O. & M. charges, I was wondering if there wasn't a separating line, either that or your present position would seem to me would have to be that given the amount of acres that you now have you could accept no new O. & M. charges and keep it economically sound. You did say, however, in your testimony, that you thought that additional O. & M. charges would at least be better than you have at the present time.

There must be some middle ground there where it begins to go downhill again, that was all that I was seeking for the record, by way of contributing to our information on this.

Mr. BARGER. It would be better, yes, sir, economically it would be better to pay a little more O. & M. charges and have a full year supply of water, but with a small farm it's still an uphill—

Senator McGEE. Yes, I appreciate it would be uphill, but the hill wouldn't be quite as steep, that's the point.

Mr. BARGER. That's right.

Senator BURDICK. Could somebody, one of my colleagues or one of the staff members, tell me on what acreage the present O. & M. charges are based?

Senator HICKEY. 17,500.

Senator BURDICK. 17,500 acres.

Senator HICKEY. I was just going to direct that question, looking at page 14, Mr. Barger, of the March 1961 report, in future estimates it indicates, based on 17,000 and 17,500, that there will be an increase in O. & M. expenditures up to \$1.65 an acre beginning next year, in 1962, and through 1964. I take it from what you have said, without an expansion of your acreage, and with the present situation, I mean, an expansion on the individual unit acreage, and a reduction of the total overall acreage, that you would not be able to bear even the future estimates.

Mr. BARGER. That's right, sir. For a small farm I think that's right.

Senator McGEE. Do I understand that to mean, then, there is a difference in your estimate between the future estimates per acre on an individual unit and the loading on of the full O. & M. charges on a reduced total acreage of 13,000 acres? Would there be a difference there? This present increase is projected on 17,500 acres up to \$1.65 through 1964. Is it conceivable that you still could absorb that if they didn't load onto you the total cost of the 17,500, on a 13,000-acre

basis, which would mean not \$1.65, but perhaps, I don't know what it would figure out, \$1.85 or \$1.90?

Mr. BARGER. Yes, sir; that's possible on a larger farm.

Senator MCGEE. But not on your present unit?

Mr. BARGER. No, sir.

Senator BURDICK. In other words, do I understand you couldn't pay the \$1.65 in 1965, the year 1965, on your present acreage and come out?

Mr. BARGER. I'm not going to come out regardless. Take the average farm here, 200 acres, with the other expenses, even with a full supply of water they are not going to come out. As I say, I don't have experience here, but I can add 2 and 2 now. This last year I got a half a supply of water, if I doubled my production, and I got so much hay out of that water, if I doubled that, it just doesn't add up. There are certain fixed expenses, like gasoline, electricity, taxes, and everything else, it's just an impossibility to make a living on 200 acres in this area.

Senator HICKEY. I wonder if we could draw that out a little finer. With the 4-year experience, do you have a figure of actual production per acre, what is the normal production over the 4-year period of what you produced per acre in dollars and cents?

Mr. BARGER. On my farm you mean?

Senator HICKEY. Yes.

Mr. BARGER. Well, it's been very low, sir. Typically it is low the first year. All my land was new land, and never been planted before. The first year, well, the first year I planted alfalfa, you don't get nothing, you don't even harvest it. The second year I got one-third of a ton per acre. The third year I got about two-thirds of a ton per acre, and this year I got over 1 ton, about a ton and a third per acre.

Senator HICKEY. I think if I can use Mr. Coppes', and let's just use it on this last year, he indicated that baled hay would sell about \$25 a ton, so that would be a yield of about \$25 per acre on this your best year.

Mr. BARGER. Yes, sir. The last 2 years I only had water for half a crop.

Senator HICKEY. But let's just take your best year, which is pretty good dryland farming with a ton an acre.

Mr. BARGER. Yes.

Senator HICKEY. That would be a yield of approximately \$25 an acre. Now, what's your cost per acre of operation; have you attempted to establish that?

Mr. BARGER. Yes, sir. Last year my operating costs, I held them to a very minimum, and I think they were about \$3,800, that was actual expenses, that included interest but it didn't include any investment in capital items, about \$3,800. And I think my expenses this year would be approximately the same.

Senator HICKEY. And that would be \$3,800 divided by, let's say, 237, is that right?

Mr. BARGER. Yes, sir.

Senator HICKEY. I'm told by the staff, this figures out about \$17 per acre, the figure you've given me. I'm told by the staff that in the information they have the lowest possible, or approximate, is \$24 per acre, which would leave you in the vicinity of about a dollar per acre

net profit, is that about correct, to take care of your family and your personal needs?

Mr. BARGER. That's about the way it figures out.

Senator HICKEY. Which, over a period of a year, for \$237, won't go very far in taking care of a family for a year.

Mr. BARGER. It sure won't.

Senator HICKEY. I have no further questions.

Senator McGEE. One more that follows that one, Senator.

One of the alternatives here that we have been talking about, that is, cutting the project down to 13,000 acres, as a point of discussion, this still wouldn't solve our problem?

Mr. BARGER. No, sir.

Senator McGEE. You are still losing money, or threatened with going out of business, so that if we were to come out of this room with the belief that if we could reduce the project to 13,000, as the alternative that was the closest practical reality, that you would still be in difficulty and facing the prospect of selling out?

Mr. BARGER. Yes, sir; I and about—

Senator McGEE. Your solution would have to couple that with increasing the acreage?

Mr. BARGER. Yes, sir.

Senator McGEE. Which means cutting down the total number of units, or farms, in the project?

Mr. BARGER. Yes, sir.

Senator McGEE. I think this was not as clear as it has now been drawn out when you finished your testimony. The impression was being left that the preponderance of the weight of your remarks was on making the project, total project, smaller, and that thus you were agreeing with those who had preceded you, but you would give equal weight, at least to increasing the size of an individual holding?

Mr. BARGER. Yes, sir. I assumed that that would follow, that the ones who stayed here on this 13,000 would find a way to increase the size of their unit.

Senator McGEE. Well, but you could only do that by eliminating some others?

Mr. BARGER. That's right.

Senator McGEE. And you eliminate them, you do this by purchase or let the law of economic survival—

Mr. BARGER. I guess by purchase.

Senator McGEE. The suggestion was submitted here earlier today in the testimony that this was one of the alternatives, just forget about the whole thing and those who could survive would survive, let the rest of them go under. Well, here we are trying to avoid that kind of a path to follow, of course, and that's the reason I'm curious about how you are going to increase the size of the unit such as yours.

Mr. BARGER. I guess that's what I was thinking of. As much as I know about other projects in Wyoming, this seems to be the pattern. All of them, from the standpoint of the individual farmer, have been failures, but they have, I understand, solved themselves.

Senator McGEE. Again I wanted to make sure the record was clear on this point.

That's all I have.

Senator HICKEY. Thank you, Mr. Barger.

I have two announcements. The ladies have some lunch ready, and, second, we'll have copies of this transcript ultimately made. If those interested will give us their names, they will receive a copy. Give your name and address to Mr. Gose.

(Recess taken.)

AFTERNOON SESSION

Senator HICKEY. We would like to call Mr. Harry Thuesen, the assessor of Sweetwater County.

And I would like unanimous consent to make a part of the record the statement given me by Mr. Vern McMurry with regard to the interest of the farm he owns.

O. & M. COSTS

1958	-----	\$300. 51
1959	-----	351. 54
1960	-----	351. 54
1961	-----	351. 54

Acres in farm : 280.

Acres irrigated last 3 years : 200.

1958 : Four irrigations, 2 tons alfalfa per acre.

1959-61 : Two irrigations, 1 ton hay per acre.

1960 : About 800 pounds of hay per acre.

Last 3 years not sufficient water to mature grain.

We need 3 acre-feet to have sufficient water on this farm.

Senator HICKEY. Mr. Thuesen, please identify yourself.

STATEMENT OF HARRY THUESEN, COUNTY ASSESSOR,
SWEETWATER COUNTY, WYO.

Mr. THUESEN. I am Harry Thuesen, the county assessor of Sweetwater County.

Senator HICKEY. And you have occupied that position for a number of years?

Mr. THUESEN. Yes, since 1937, Senator.

Senator HICKEY. And during the course of your duties you have had occasion to come in and evaluate, for the purpose of taxation, on the ad valorem basis, the land contained in this project?

Mr. THUESEN. That is correct.

Senator HICKEY. Have you made a breakdown of the lands and their appraisals?

Mr. THUESEN. Yes, I have, Senator. In fact, I have here ready to submit a listing of all the landowners in the Eden-Farson area, listing the number of acres, the land value, the improvement value, personal value, the total assessed valuation, and the total taxes for the year of 1961.

Senator HICKEY. Is there objection to making this part of the record? [No response.]

Senator HICKEY. Being none, will you hand it to Mr. Bjella?

(The exhibit is as follows:)

	Acres	Land value	Im-prove-ment value	Per-sonal	Total value	Total taxes
Aguirre, John, Lucille, Joe.....	4.00	\$112			\$112	\$4.61
Anderson, Mrs. C. L.....	80.00	2,100	\$760	\$1,794	4,654	191.68
Anderson, Elmer.....	80.00	1,200	100		1,300	53.54
Anderson, Harold.....				184	184	7.58
Anderson, Vern H. and Eliz. R.....	565.64	5,446	200	500	6,146	253.13
Andrews, Mrs. John c/o Mrs. June Harrison.....	38.65	952	374		1,326	54.61
Applequist, Marvin N. and Betty A. Sr.....	632.58	4,338	200		4,538	186.90
Auld, Robert and Kathryn.....	43.05	645	176		821	33.82
Barger, Thomas J. and Dorothy B.....	410.99	6,044	4,735	1,410	12,189	502.02
Bauer, Magness.....	341.40	3,960	646		4,606	189.70
Beard, Charles.....			250		250	10.30
Bell, Robert R. and Eleanor.....	80.00	1,330	500	175	2,005	82.58
Benson, Alma Dee and Melba.....	133.01	2,076			2,076	85.50
Big Sandy Livestock Co.....	960.00	16,688	2,703	8,672	28,063	1,155.80
Blair & Hay Land & Livestock Co.....	965.00	5,608	2,250	38,430	46,288	1,906.42
Bowen, Elizabeth, et al.....	160.00	320			320	13.18
Brantley, Alva O. and Ruth E.....	353.71	5,357	1,200	1,408	7,965	328.05
Brown, George M. and Lois Ann.....	401.02	6,354	1,210	3,745	11,309	465.77
Buchanan, Archie and Gladys.....	76.00	2,128	581		2,709	111.57
Cady, John.....	120.00	3,099	804	1,950	5,853	241.06
Carter, Glenn G. et al.....	40.15	555	50		605	24.92
Chesnovar, Rudolph and Ruth Marie.....	40.00	600	50		650	26.77
Do.....	320.00	3,480	749	3,808	8,037	331.01
Chilton Land & Livestock Co.....	478.49	5,748	200		5,948	244.97
Do.....	240.00	6,369	448		6,817	280.76
Clark, Norman L. and Vera.....	159.75	4,174	1,319	1,000	6,493	267.42
Columbia, Geneva Steel Division.....	479.58	4,132	100		4,232	174.30
Do.....	12.00	36			36	1.48
Do.....	3.00	30			30	1.24
Coppes, John A.....	120.00	1,640	100	860	2,500	102.97
Coppes, John A. and Esther.....	179.73	1,760	12,015	13,700	27,475	1,131.59
Do.....	470.65	6,328	750		7,078	291.51
Dack, Ray M.....	80.00	1,200	779		1,979	77.55
Dack, Ray M. and Marjorie.....	353.30	2,932	200	2,293	4,222	175.95
Dearth, Mrs. I. H.....	160.00	4,480	150		3,132	128.99
Delmastro, Thomas E. and Marian C.....	240.00	3,672	2,097	1,731	4,630	190.69
Dennison, Frank M.....	76.00	1,478	1,803	808	7,400	304.78
Eaton, Robert B. and Charlotte V.....	480.00	3,816	664	6,511	4,089	168.41
G. & E. Livestock Co.....	473.19	5,140	200		10,991	452.68
Grandy, Lynn W.....	1,140.00	6,444	6,327		5,340	219.93
Greig, Robert W. and Pearl E.....	720.00	7,880	5,544	7,830	12,771	525.99
Griffin, Emmett O. and Lorena A.....	338.68	6,398	1,978	3,169	21,254	875.37
Hadley, Percy H. and Audrey.....	158.91	3,812	150		11,545	475.49
Do.....	240.00	2,560	2,061	3,390	3,962	163.18
Hafey, A. M. c/o, Shirley Benson.....	75.90	1,988	1,285		8,011	329.94
Do.....	118.42	3,164	200		3,273	134.80
Do.....	155.70	4,160	4,216	6,535	3,364	138.55
Harrison, Paul Harold and June.....	1.35	25	2,078	1,990	14,911	614.12
Hennecke, August.....	200.00	4,276	2,145	1,900	4,093	168.57
Henry, Floyd and Edna.....	80.00	2,240	1,430	1,603	8,321	342.71
Hodder, Eugene and Helen L.....	497.22	4,358	3,896	2,730	5,273	217.17
Hudak, Joe c/o Gus Stevens.....	31.65	896	320		10,984	452.89
Hunsaker, Wilford L. and Isabell.....	509.63	7,088	250	1,000	1,216	50.08
Ingle, Leonard and Charlotte A.....	238.81	2,161	200		8,338	343.41
Jamieson, Elsie A. and Elsie I. Watterson.....	76.59	1,944	100		2,361	97.24
Jamieson, Elsie A. and Elsie Watterson.....	71.00	1,988	237		2,044	84.18
Do.....	80.00	2,128	2,553	3,194	2,225	91.64
Jamieson, Josephine R. Dearth.....	320.00	7,920	6,706	3,290	7,875	324.84
Jensen, Clarence.....	40.00	1,120	1,709	1,140	17,916	737.89
Jensen, Clarence A. and Blanche C.....	160.51	1,198	100		3,969	163.47
Johnson, Kirby E.....	80.00	1,435	400	650	1,298	53.46
Joslin, D. W. c/o Vernon Blumel.....	155.54	3,120	1,767	5,265	2,485	102.85
Kesler Estate, Arthur E.....	80.00	2,240	1,224	1,000	4,464	183.85
Kesler, Gilbert.....	39.55	1,120	50		4,464	183.85
Matilainen, Veko.....	80.00	1,447	1,043	2,003	1,170	48.19
Matilainen, Veko and Larene.....	279.51	2,841	200		4,493	185.05
Meyer, Fred W. and Allie.....	360.00	5,842	1,096	4,831	3,041	125.25
Meyer, Lucy N.....	5.69	90		330	11,760	484.72
Midland Livestock Co.....	320.00	2,720	1,000	5,710	420	17.50
Miller, Galen R. and Eunice P.....	414.92	3,190	200		9,430	388.38
Mines, James and Florence.....	793.23	5,623	4,615	2,937	3,300	139.62
Mrak, Vernon A. and Marian M.....	647.53	4,860	543	850	13,175	542.63
Murphy, James E. and Donna.....	80.00	2,136	782	1,793	4,253	257.54
Do.....	79.98	1,125	100		6,711	194.03
Do.....	80.00	2,162	688		1,225	50.45
Do.....					2,850	117.38

	Acres	Land value	Im-prove-ment value	Per-sonal	Total value	Total taxes
McCracken, Paul E. and Rachel A	544.09	\$5,987	\$200	\$1,508	\$7,695	\$316.93
McMurray, Jack V. and Dixie J	271.54	4,806	200	1,180	6,186	254.78
McMurray, James E. and Mary Alice	372.36	6,254	3,700	1,930	11,884	489.45
McMurray, Vernon	654.13	8,419	6,262	7,600	22,281	917.67
Nelson, Gustave E. and Gladys	152.00	4,217	2,878	3,870	10,965	451.60
Nelson, Gustave E. and Gladys and Richard	238.18	4,836	2,038	-----	6,874	283.11
Nelson, Richard Y	346.94	5,152	200	3,700	9,052	372.82
Newton, Ziba and Gertrude	160.00	4,256	1,189	-----	5,445	224.26
Nickerson, Kenneth W. and Hilda M	232.00	5,911	1,915	-----	7,826	322.32
Payne, Paul F	560.00	7,386	1,067	2,380	10,833	446.17
Pehlitz, Lincoln D. and Ruth E	549.43	6,164	750	2,667	9,581	394.00
Radosivich, John T	663.00	7,640	1,739	7,460	16,839	693.53
Radosivich, John T. and Mary	10.70	500	6,980	5,700	13,180	542.83
Radosivich, John T. c/o Lloyd Kinnaman	2.70	300	3,340	2,050	5,690	234.35
Rahm, Margaret	4.40	60	1,767	250	2,077	85.54
Ramsay, Dillwyn and Ismes H	80.00	2,209	3,491	6,000	11,700	481.88
Sanders, Owen L. and L. W	480.00	10,930	3,324	6,180	20,434	841.59
Segma, Joe	40.00	1,120	611	140	1,871	77.06
Sellers, R. E. and Resella	80.00	1,200	600	-----	1,800	74.13
Sellner, William c/o Harrieta Lowe	40.00	1,120	50	-----	1,170	48.19
Sisk, Delbert and Helen	159.97	3,583	853	950	5,386	221.83
Sisk, Samuel D. and Helen	155.36	1,958	100	-----	2,058	84.76
Sitzman, Mrs. A. D.	38.00	779	12,419	2,150	15,348	632.12
Skorez, John J	120.00	3,165	2,610	1,860	7,635	314.46
Skorez, John J. and Frances	169.25	334	150	-----	484	19.93
Skorez, Mike L. and Dorothy	148.14	2,701	1,150	803	4,654	191.68
Smith, George S. and Melva M	79.00	1,316	740	1,372	3,428	141.19
Smith, Glenn S	160.00	3,030	542	2,517	6,089	250.78
Smith, Glenn S. and Anna L	323.01	1,720	-----	-----	1,720	70.84
Spicer, Eldon M	479.15	958	-----	2,534	3,492	143.82
Stassinis, James	40.00	1,120	306	-----	1,426	58.73
Stimson, Frank	80.00	2,240	667	-----	2,907	119.73
Stout, Charley J	71.00	1,858	1,101	-----	2,959	121.87
Do	160.00	320	-----	-----	320	13.18
Stout, Gerald W. and Edith	201.30	2,558	200	-----	2,758	113.59
Do	269.21	538	-----	-----	538	22.16
Do	80.00	1,681	903	1,550	4,134	170.26
Stout, William Z. and Thelma	400.00	9,515	3,232	5,564	18,311	754.16
Strong, Frank H., Inc. and Clara A. Wheat	79.00	1,185	100	-----	1,285	52.92
Swanstrom, Vivian	233.30	2,905	1,210	750	4,865	200.37
Swanstrom, Vivian L	160.00	320	-----	-----	320	13.18
Taliafero, T. S., III	40.00	80	-----	-----	80	3.29
Tomich, Edwin J. and Justyne	515.13	4,888	200	1,568	6,656	274.13
Tomich, Mary	80.00	2,240	2,478	1,886	6,604	271.99
Tomicick, Katherine	116.00	3,040	2,748	1,887	7,675	316.10
Topsick, Nicholas S	618.66	7,332	300	150	7,782	320.51
Van Matre, Vern	2.70	100	1,200	-----	1,300	53.54
Do	62.50	1,680	100	-----	1,780	73.31
Do	430.88	4,027	650	4,611	9,288	382.54
Vaughn, Jess M. and Kathleen M	438.38	3,706	-----	-----	3,706	152.64
Vigil, Abel and Antonia	160.00	2,335	1,610	1,753	5,698	234.68
White Acorn Sheep Co	320.00	400	-----	-----	400	16.47
Williams, John A. and Dora	160.00	2,022	840	728	3,590	147.86
Winters, A. W. and Ruth H	433.03	5,087	1,000	924	7,011	288.76
Wood, John A	120.00	3,308	1,000	1,808	6,116	251.89
Wood, John A. and Catherine	203.87	1,255	150	-----	1,405	57.87
Wright, Ora E. and Lenora S	198.11	1,453	150	-----	1,603	66.02
Do	280.00	1,893	538	1,150	3,581	147.49

	Acres	Land value	Im-prove-ment value	Per-sonal	Total value	Total taxes	With-out exemp-tion	Ex-empt	Car.
Burton, Joseph	357.00	\$6,797	\$2,995	\$4,388	\$14,180	\$567.54	\$584.02	\$400	-----
Fiscus, Lloyd W. and Ethel E	222.00	3,203	2,167	1,045	6,415	181.84	264.21	2,000	-----
Grandy, Leland L	638.69	6,157	300	-----	6,457	183.57	265.94	2,000	-----
Olson, Paul M	160.00	3,836	845	900	5,581	160.50	229.86	2,000	316
Pierce, A. H., c/o Leonard Ingle	40.00	1,055	1,705	1,527	4,287	144.32	176.56	2,000	1,217

Senator HICKEY. Do you break the land down by way of classification?

Mr. THUESEN. Yes, we do, Senator.

Senator HICKEY. What breakdown do you make?

Mr. THUESEN. Well, in this particular area we have, of course, the classification of irrigated cultivated land, and then we have uncultivated with water rights, and we have irrigated pasture and grazing; those are the four classifications that would apply to lands in this particular area.

Senator HICKEY. Do you have at the tip of your tongue the valuations placed on these four classifications?

Mr. THUESEN. Yes, I do. Our valuation per acre on irrigated cultivated lands is \$28 per acre. The irrigated pasture we assess at \$15 an acre, and we place that same \$15 valuation on uncultivated with water rights, and our grazing lands, grazing in connection with a farm unit, we assess at \$2 an acre.

Senator HICKEY. Do you have a question, Senator McGee?

Senator MCGEE. No, I don't.

Senator HICKEY. Senator Burdick?

Senator BURDICK. Just one question.

Can you give me, in general, the valuation of the areas outside of the area that may be irrigated?

Mr. THUESEN. Well, that irrigated valuation of \$28 per acre is used throughout the county on all irrigated cultivated land, Senator.

Senator BURDICK. What about similar land that is not irrigated; what valuation does that carry?

Mr. THUESEN. You are meaning similar land?

Senator BURDICK. Without irrigation.

Mr. THUESEN. Without irrigation, are you speaking of dry farmland?

Senator BURDICK. Yes.

Mr. THUESEN. We don't have any dry farmland. I don't assess any dry farmland in Sweetwater County, Senator.

Senator BURDICK. I guess that answers the question.

Senator MCGEE. The nearest thing to it would be grazing land?

Mr. THUESEN. Yes.

Senator HICKEY. Mr. Thuesen, do you have a formula by which you arrive at these valuations? By that I mean, are they full value or a percentage?

Mr. THUESEN. Well, we don't, as far as our land values. We are not set up on a strict percentage formula, but they are supposed to be set, and these are directives sent to us by the State board of equalization in conformity with other assessed valuations, and necessarily should follow a percentage pattern.

Senator HICKEY. And is uniform in the entire State?

Mr. THUESEN. That is true.

Senator HICKEY. Do you have any idea of the percentage of this project that is irrigated, cultivated, or a breakdown of that kind?

Mr. THUESEN. No, I don't have, Senator.

Senator HICKEY. I have no further questions.

Senator MCGEE. One question comes to mind, Senator Hickey.

Your figures that you have just submitted will show this. I'm just wondering, in general broad terms, what the improvement of

this land, which the project itself represents, even in its marginal status, means to the county in terms of tax base.

Mr. THUESEN. I don't quite follow you, Senator.

Senator MCGEE. Before there was an Eden project, and the land was untouched, it obviously had a much lesser value.

Mr. THUESEN. Oh, yes.

Senator MCGEE. Because of the improvement, because of the projects, this has meant an increased valuation, and thus increased income to the county.

Mr. THUESEN. That is true.

Senator MCGEE. Do you have a rough figure in mind that would suggest what this amounts to?

Mr. THUESEN. Well, no, I don't have that to give it to you exact. I would try and think back, though, and I would state, of course, not accurately, but there probably has been an increase in the assessed valuation of probably between \$200,000 and \$250,000 from the time that this has—

Senator MCGEE. Yes, this is the—

Mr. THUESEN. In this particular school district I'm speaking of.

Senator MCGEE. Perhaps if we could calculate it, you might supply a rather close figure for the record. I mean, that can be added in the record later on?

Mr. THUESEN. Yes, I could.

Senator MCGEE. I think it would be helpful in keeping this picture in balance.

Mr. THUESEN. Yes, that could be done. I don't happen to have that information with me.

Senator BURDICK. Maybe this will be a sidelight. You say that prior to the coming of the Eden project it was all grazing land?

Mr. THUESEN. Well, prior to the time that any of the land was put under development it was all grazing land, Senator, but, of course, there has been a community and farming area here for a number of years, see, prior to the time that this present project was established.

Senator BURDICK. But that had irrigation, too?

Mr. THUESEN. Yes, those lands had irrigation.

Senator BURDICK. Without irrigation—I'll get this point across yet—without irrigation of some kind it has a grazing land value of \$2 an acre?

Mr. THUESEN. That is true.

Senator HICKEY. No further questions?

(No response.)

Senator HICKEY. Thank you.

Mr. Lynn W. Grandy.

STATEMENT OF LYNN W. GRANDY

Mr. GRANDY. Mr. Chairman, honorable committee members, and friends, my name is Lynn W. Grandy. I have been a resident of Eden Valley for the past 52 years. I own about 1,100 acres of land along Big Sandy Creek beginning about 2 miles north of Farson. Some 175 acres of this land carry a water right under the Eden project. I also have a private water right out of Big Sandy Creek for part of my lands along the river bottom.

I hope you will bear with me if some of my testimony overlaps and is a repetition of what has been given before, but perhaps some of these points will bear a little repetition.

The other witnesses have given you the background of the situation here including our present problems, their cause, and a cross section of the ideas of the farmers regarding them. I wish to offer some comments on "Eden Project Wyoming, Water Supply Review" issued by the Bureau of Reclamation in March of this year. This review was made, partially at least, in response to a request from the Board of Commissioners of the Eden Valley Irrigation and Drainage District for such a study.

As you are all aware, our big problem is a shortage of irrigation water. Obviously there are only two possible solutions to this problem. One is an increase in the water supply, the other is to reduce the irrigated lands sufficiently to make the present water supply adequate.

First, I wish to show why we consider this condition to be a long-range problem rather than a temporary condition caused by a drought. We have experienced our most serious shortages during the past 3 years and the Bureau contends that this is very unusual and cannot be taken as a criterion of the future. Their contention is supported by records and, no doubt, is correct regarding the past; however, we have had 3 successive years of drought this time and there is no guarantee that this will not happen again. We cannot be sure it is over now. This condition could extend over a 4- or 5-year period.

I wish to quote from page 23 of the Bureau's review the following figures. The table on this page shows the shortages which would have occurred for 17,000 irrigated acres with a diversion demand of 4 acre-feet per acre which supposedly would deliver 3 acre-feet per acre at the farms.

I might pause here to state that, as you already know, the Bureau contends that a diversion of 4 acre-feet, and the loss of 25 percent, will make a 3-acre-foot delivery at the farm. Our contention is that, as has been brought out in previous testimony, that the losses are greater than that, and also that 3 acre-feet is not sufficient delivered at the farm to produce a full crop. But these figures I am quoting right here are from the table in this report.

Three percent of 17,500, or 500 acres, have been eliminated as allowance for roads, farmsteads, et cetera. This leaves a diversion requirement of 68,000 acre-feet. I shall quote the data given for the past 10 years, including 1961. The figures for this year are not given in the table but I secured them from the Bureau office in Rock Springs.

The report includes 1960 as the last season for which data was available. I have in the table here the acre-feet and also the percentage of shortage. I think the percentages are the important thing, so I will read those. If anyone wishes the acre-feet I have them here, but I feel that the percentage actually shows the shortage. Acre-feet don't mean so much to us.

Senator McGEE. The actual acre-feet can show in the record, can't they, Mr. Chairman?

Senator HICKEY. We will receive the entire statement for the record.

Mr. GRANDY. The year 1952 was no shortage; 1953, 4.3 percent; 1954, 12 percent; 1955, 33.6 percent; 1956, 13 percent; 1957, no shortage; 1958, 5.1 percent; 1959, 38.9 percent; 1960, 54.5 percent; and 1961, 57.2 percent.

Year	Shortages		Year	Shortages	
	Acre-feet	Percent		Acre-feet	Percent
1952.....	0	0	1957.....	0	0
1953.....	2,900	4.3	1958.....	3,500	5.1
1954.....	8,100	12.0	1959.....	26,500	38.9
1955.....	22,900	33.6	1960.....	37,000	54.5
1956.....	8,900	13.0	1961.....	38,880	57.2

Senator McGEE. For the record, those percentages are the percentage of the total requirements that were short, or that were delivered?

Mr. GRANDY. Those percentages are the shortages.

Senator McGEE. So that for 1961, 57 percent means that only 43 percent of the needs, of the water needs, were actually delivered?

Mr. GRANDY. Correct.

Senator McGEE. All right.

Mr. GRANDY. Only 2 years out of the 10, 1952 and 1957, show an adequate supply by the Bureau's own analysis, and accepting its figure of 3 acre-feet per acre delivered at the farm as sufficient for a season's irrigation. Shortages exceed one-third, or 33 percent, in 4 years out of the 10. If we are correct, and previous testimony indicates that we are, in placing our requirement at $3\frac{1}{2}$ acre-feet per acre at the farm which would require 4.7 acre-feet diverted, the shortages would be increased as follows.

I shall again read the percentages as figured on the $3\frac{1}{2}$ -acre-foot requirement rather than the 3: 1952, no shortage; 1953, 14.9 percent; 1954, 21.7 percent; 1955, 41 percent; 1956, 22.7 percent; 1957, no shortage; 1958, 15.7 percent; 1959, 45.6 percent; 1960, 59.4 percent; 1961, 61.9 percent.

So taking 1961 as an example, Senator McGee, it would reduce the water delivered down to approximately 38 percent of needs.

Senator McGEE. Yes.

(The table referred to is as follows:)

Year	Shortages		Year	Shortages	
	Acre-feet	Percent		Acre-feet	Percent
1952.....	0	0	1957.....	0	0
1953.....	11,400	14.9	1958.....	12,000	15.7
1954.....	16,600	21.7	1959.....	35,000	45.6
1955.....	31,400	41.0	1960.....	45,500	59.4
1956.....	17,400	22.7	1961.....	47,380	61.9

Mr. GRANDY. Shortages during this period have actually been felt during the last 3 years only, because the irrigated acreage was small previous to this time, and has never exceeded 13,000 acres actually irrigated at any time.

The table quoted gives data on the runoff since 1921 and averages are based on all of these years. Many of these figures are estimates. Actual readings have been made only since 1939 on Big Sandy at the Leckie Ranch and on Little Sandy at Elkhorn, with readings at the diversion points for the Eden project only since 1953 on Big Sandy and 1954 on Little Sandy. It seems only reasonable that future runoff of these streams could be much more accurately forecast from actual runoff in the past 10 years than by including figures of 30 or 40 years ago. Those of us who have been here for some time have noted a definite change in our climatic conditions. Whether or not it will be permanent, only time will tell, but it has had a very noticeable effect for several years. I can remember back quite a number of years after we started on this project that our spring moisture here was sufficient to start a crop, bring it up, get our grain stooled and things nicely started, but for the past number of years practically every spring we have to irrigate everything up. It seems to be a definite trend over the years.

From page 3 of the review, under "Conclusions and Recommendations," point 7, I quote:

The additional water that could be made available through lining the project's west side lateral and pumping of return flow from Big Sandy Creek and conveying it 1.56 miles to the west side lateral would reduce shortages for a 17,500-acre project to within tolerable limits.

No indication of what is meant by "tolerable limits" is given. The table on page 24 of the review, which gives simulated shortages with the suggested improvements, shows serious shortages for 1955, 1959, and 1960. This year, 1961, would add one more making four serious shortages during the past 10 years had the improvements been in use. These are, of course, figures compiled by the Bureau which assumes that 3,300 acre-feet can be supplied annually from the Big Sandy pumping station. We contend that this figure is too high. Actual measurements made during the past summer have shown only $7\frac{1}{2}$ second-feet of flow, which is just half of the assumed figure. The Bureau states that the figure is low because the streamflow was only half of normal the past season. This is the condition under which the extra water is needed. I also wish to point out that the streamflow is completely stopped at the dam, some 10 miles above the pumping site. It hardly seems likely that a larger streamflow would increase the return flow which consists of seepage water only except for a small amount of runoff from a few farms during the irrigation season. The quality of this water also seems very questionable for irrigation purposes. That's been touched upon before, and I definitely agree that the quality is not what we would desire.

Lining the west side lateral as well as the other canals could prove to be quite beneficial. It is too early to evaluate results from the wax emulsion which was used on the one lateral last summer. Those who are making the tests, including the Bureau officials, have told us that it's necessary to wait until spring and see what effect the freezing and thawing have on this treatment in order to evaluate it. Last summer the results were very encouraging, but what they will be after it's passed through a winter—

Senator McGEE. Saving what, 50, 60 percent, 70 percent?

Mr. GRANDY. It's in that report; it runs in my mind about 60 percent of the loss was conserved, but what it will be this season, after passing through the winter season, I don't know until tests can be made this coming season.

During the past 3 years, the acreage actually irrigated has not exceeded 13,000. An additional 4,000 acres would mean an additional minimum requirement of 12,000 acre-feet at the farms. Assuming the Bureau's figures on extra water from the proposed improvements to be correct, they would not supply over half of this amount, and using our figures of $3\frac{1}{2}$ acre-feet delivered, it would be even a smaller fraction. We contend that the benefit realized would be much less.

On page 25 of the report, under "Other Ways of Increasing the Project Water Supply," the review states:

Three possible means of increasing the project water supply in order to permit expansion of irrigation beyond 17,500 acres have been considered. These include (1) enlargement of Big Sandy Reservoir, (2) providing facilities that would permit the diversion of water from Big Sandy Reservoir to the Eden Reservoir, and (3) diversion of water to Eden project from nonproject streams.

The discussion which follows states that only a combination of (1) and (3), that is, additional storage together with diversion from East Fork River, is worthy of further investigation. Most certainly we residents of the project will strenuously object to consideration of expansion beyond the present acreage until our existing needs have been supplied.

If bringing water from nonproject streams were found to be justified to relieve the present shortage, such a procedure would require considerable time. Economic conditions here are such that immediate relief seems imperative. Various sources of credit to the farmers, including Farmers Home Administration, have placed severe restrictions on additional loans. Many of the farmers have been forced to obtain employment on construction jobs, or wherever work can be had to meet living expenses. Many of the old, well-established farmers find themselves using what reserves they have accumulated in past years and are in about the same position as the new settlers.

Our farming conditions here are marginal even under favorable conditions, and very few farmers succeed in accumulating sufficient reserves to carry them over short years without undue hardship. If water shortages occur more often than every 5 or 6 years, the situation becomes very difficult. Payments on the reimbursable costs of construction begin soon on some of the lands, and will start within a few years on the others. This, of course, will add to the present financial load. These reimbursable costs begin, the project is divided into various blocks of land, on block one it begins within a short time, I don't remember the exact date, but the various blocks come in at different periods, that's the reason the payments on all the land do not start at the same time.

I mention these facts to show that although we have a long-range problem, we feel we cannot wait indefinitely for a solution. We hope mother nature will come to our rescue with a larger supply of water, but if she does, we do not want our present condition perpetuated by adding 4,000 more acres, not presently irrigated, to the demand for water. Since additional sources of water are virtually eliminated by

the Bureau's own review and the time element, we feel the only alternative is to reduce the acreage to be irrigated. It has been pointed out that operation and maintenance costs will be higher per acre on fewer acres. We recognize this fact, but feel quite sure that 13,000 acres with a full crop are much more able to meet the total costs than are 17,500 acres with only one-half or one-third of a crop. As all of you are aware, overhead costs, maintenance costs, and everything, are the same, whether you raise a full crop or whether you raise a third of a crop, the costs are approximately the same, but your receipts are definitely in proportion to what you raise.

Based on evidence given in the testimonies here today, and allowing for increased farm efficiency, we consider $3\frac{1}{2}$ acre-feet per acre delivered at the farm to be the amount of water necessary for satisfactory crop production as an average for the whole project. With delivery losses calculated at the extreme minimum, this would place diversion requirements at 4.7 acre feet per acre. This figure, together with past experience, has given us 13,000 as the maximum acreage to be irrigated if our water supply is to be dependable. With this limitation, we would still experience occasional shortages as we have in the three years just past.

I thank you.

Senator HICKEY. Senator McGee?

Senator MCGEE. Only one question, Mr. Grandy.

In your concluding statement you mentioned without question the 13,000 acres could come closer to meeting the full cost than the 17,000 acres with the present supply of water. Did you mean to leave the impression that you thought the 13,000 acres, if the project were held to that, could, in fact, meet the full costs?

Mr. GRANDY. That's my opinion, yes, sir.

Senator MCGEE. Would you care to comment more specifically on the size of the existing units; do you think it's important to adjust the size of these units upward?

Mr. GRANDY. I feel that that situation will take care of itself. It's been discussed some here before. There is one factor in determining the size of these units, which I think has not been mentioned here today, that's the individual who operates the unit. As we all know, we don't all have the same capacities. A smaller unit for one individual perhaps will suffice, but for someone else a larger unit is necessary.

I feel that if this acreage, if the irrigation problem is taken care of, that perhaps buying and selling between individuals will take care of it and will adjust the size of those units to the individual operating them.

Senator MCGEE. Is what you are saying that there are farmers and then there are farmers?

Mr. GRANDY. That's right. I don't feel that we can say definitely so many acres are necessary as a unit, there is too much variation in the management and the human element.

Senator MCGEE. That's all I have.

Senator HICKEY. Senator Burdick?

Senator BURDICK. I've got two areas that I would like to question the witness on.

If the project were reduced to 13,000 acres and the operation and maintenance costs are based upon 17,500 acres, would the farmer be willing to absorb the additional costs of operation and maintenance?

Mr. GRANDY. He would necessarily have to. As far as I'm concerned, I'm willing to. I would feel much better off paying additional operation and maintenance with the acreage reduced than I am under the present conditions.

Senator BURDICK. You talked about increasing the size of the units, would there be any unit that you could think of that would be in excess of 320 acres?

Mr. GRANDY. That is now in excess?

Senator BURDICK. Yes.

Mr. GRANDY. Oh, yes.

Senator BURDICK. You talked about increasing the size of the units, are any units contemplated over 320 acres?

Mr. GRANDY. Not under the present setup. Larger units than that, the owner has acquired additional land.

Senator BURDICK. The question comes to my mind about the restrictions in the reclamation law, itself, which limits it to 160 acres, and with man and wife makes 320, and I was just wondering if there is any great demand to go beyond that.

Mr. GRANDY. Under this project an exception has been made in these new units of approximately 200 irrigated acres on them, and I feel that any adjustment necessary from that, which probably would be larger in most cases, would be taken care of by individuals buying and selling between themselves if we can just solve the water problem. I think the size of the units would resolve itself.

Senator BURDICK. Well, based upon a 13,000-acre project, would a 320-acre unit be a feasible unit?

Mr. GRANDY. Irrigated acres?

Senator BURDICK. Yes.

Mr. GRANDY. I think it would, yes.

Senator BURDICK. That's all.

Senator HICKEY. I have no questions.

Thank you very much, Mr. Grandy.

Mr. Emmett Griffin.

STATEMENT OF EMMETT GRIFFIN

Mr. GRIFFIN. Mr. Chairman and Senators, and members, I have a map of my farm, if it would be beneficial in the records.

Senator HICKEY. We can file it. We could file it for the record, but it apparently can't be reproduced. You have the request here to return it.

Mr. GRIFFIN. Yes.

Senator BURDICK. We can have it up here while you testify.

Mr. GRIFFIN. My main objection to that farm unit is pasture. You can see how it's laid out, there is no room for pasture of livestock. I have a hay unit and nothing for livestock.

I have just very brief testimony here, and on my operation and maintenance paid, it's \$297.81 per year, that is my assessment on each acre on 220 acres of irrigable, which is the size of my farm, and I have a total of 338 acres.

I am in the subirrigated land, that's in the E units on the east side of the highway, and there are seven of those farms in the E units that are subirrigated. It's entirely different irrigation, that you

soak water through the ground, through ditches, and you build up your sub to support your crop rather than surface irrigating, irrigating that way.

My yields here, in 1959, it's 388 tons, and in 1960 it is 187 tons, and in 1961 it's 136 tons.

I have here my average price that I have sold that hay for. I haven't sold all this year's hay, but I have sold some at \$25.

Senator McGEE. Is that the high?

Mr. GRIFFIN. The high on hay was last year of \$30.

I have no irrigated pastureland, it is all seeded in alfalfa and was seeded when I purchased it 3 years ago from the Government.

The Soil Conservation Service believes 2½ acre-feet per year will grow crop and maintain sub. I believe this is close to being right. And the amount of water I have used in the last 3 years is 2.2 acre-feet in 1959, 1.8 acre-feet in 1960, and 1.4 acre-feet in 1961.

If you will notice, I am almost a year short in my 2½ acre-feet per year.

Senator McGEE. You say that was a SCS figure, the 2½?

Mr. GRIFFIN. Two and a half will maintain the sub units, maintain my sub and grow and produce a crop.

The next thing on this is the economic picture, and we have assessed for electricity out there to pay for the maintenance of the line, normally the minimum in this valley is \$15 per unit, per farm, and we were assessed for 2 years, \$23 per month. Actually, we were splitting three minimums between two farmers out there. And then in 1961 there was one other unit hooked on, so they split it down then to \$19 per unit rather than the \$23.

Mr. Thuesen has already mentioned the taxes. I have here my land taxes only, which is assessed at \$28 per irrigable acre, and, as you know, our taxes were intended to be 25 percent of full assessment on the land for a period of up to 2 years, I believe, and then they were to bring it up to full value as the years went by. But there was no ruling to that effect other than they just agreed, and there was an objection to it, so then they this year had to bring our taxes back up to the full value of \$28 an acre, which made quite an increase in land taxes alone.

Then in economics, more added to this, this is things that help lead to hardship and poverty, I have 14 miles to travel to the post office, there is no mail delivery, and we have two post offices that are close together, one in Farson and one in Eden. My personal feeling, I think we should have maybe one post office and a mail delivery, if possible, in the valley would help, because it adds up to a lot of money when you start figuring every farmer running in back and forth to town to get his mail.

Road maintenance is poor in the valley due to sandy conditions, blowing, and some dobe mud, and they are usually very rough on vehicles, as you probably know, sand getting in the bearings, this and that, which makes a tremendous expense to keeping up your vehicles. The gas and oil is high, which adds to tremendous costs.

There is no fruit in the valley and very poor gardens, which makes groceries real costly. You have to buy most everything that you eat, except in the meat line, which you can produce on the farm.

Another thing is a 106-mile drive to buy feed, and there, again, being a small unit, you buy things in small amounts, whereas, if you was a bigger operator you would buy in truckload lots and you could save. Whereas, you could imagine going 106 miles to buy a few sacks of bran, or something.

Then, also, you have this livestock, if you have a couple of cows, a few pigs, or a few sheep, which is all I can carry on my farm, you load that into a truck and travel 150 miles and it costs you more to deliver it than you get out of the livestock.

That's about all my report, and thank you.

Senator HICKEY. Senator McGee?

Senator McGEE. No, I don't think I have any questions, Mr. Chairman.

Senator HICKEY. Senator Burdick?

Senator BURDICK. Why can't you grow fruit and vegetables?

Mr. GRIFFIN. We have a frost of some kind almost every month of the year. This past year we had a very good growing season; it was warm, but then we didn't have the moisture to go along with it.

Senator BURDICK. Can't you use irrigation water for that?

Mr. GRIFFIN. Yes.

Senator BURDICK. But your season isn't long enough?

Mr. GRIFFIN. It's very unprofitable. You plant some vegetables, it costs a lot for seed and work, and then it freezes down on you and you just lose it. We tried it 2 years and it's just not worth it.

Senator BURDICK. This is off the record.

[Discussion off the record.]

Senator HICKEY. If there are no further questions, you may be excused.

Mr. Claud Watterson.

STATEMENT OF CLAUD WATTERSON

Mr. WATTERSON. Claud Watterson is my name. I operate and lease 480 acres in Eden Valley. I own a farm here, and I'm a sheep rancher.

I would like to take this opportunity to thank the gentlemen for coming here today and to listen to our water problems that we have here.

I have some of the crop yields on my acreage from 1958. It will give you some kind of an idea on the shortage on water and the shortage of the crop yield, that's in the southwestern unit of Eden Valley, which is a dry unit.

The crop yield for 1958, the production is 165 tons off of 240 acres, 83 tons of grain off a hundred acres. The water used that year was 3 acre-feet.

In 1959, the crop yield off of 290 acres, 280 tons. The water used, 2 acre-feet.

The 1960 yield, 113 tons off of 390 acres, and off of 60 acres of grain, 19,000 pounds.

In 1961, off of 360 acres, 155 tons of hay; 90 acres of grain, 12,000 pounds; 30 acres of this grain wasn't even combined. The water use, 1.5 acre-feet in 1961.

So you can see, gentlemen, the shortage from year to year, and the shortage of water and the shortage of yield on acreage over this period

of years. In our section of the valley, in the southwest section, it would require 4 acre-feet of water to come up to normal production to where in other sections of the valley the land varies.

Like Mr. Griffin has over here, he has a sub, our ground don't sub in the southwestern part of the unit down here. Some of the yields they get as much production on less water that it would take us the way the ground varies. So by this, you can see what the water shortage, how it affects the farmer here in different units of the valley. And if we continue, we have been told that under normal years we wouldn't have had this water shortage, but if it continues in the next 2 years, like it has the last 3, there won't be very many of us left here to tell about it. It's just like you say, it's the survival of the fittest now to sit this thing out, but that's about the way it stands now on this water.

That's all I have, gentlemen.

Senator HICKEY. Senator McGee?

Senator MCGEE. No. That's a very eloquent set of statistics that you have there, that reflects the depreciation of income in direct proportion to the water. It also, I think, reminds us of the variables within the project, itself, in terms of the types of soil, and thus the amount of water that can grow similar amounts, produce similar amounts, but I have no questions to put to you on that.

Senator HICKEY. Senator Burdick?

Senator BURDICK. According to my notes, you had 3 acre-feet of water in 1958, and 2 feet in 1959; is that right?

Mr. WATTERSON. Two feet in 1959; yes, sir.

Senator BURDICK. And 3 in 1958. You had 165 tons of hay in 1958 and 290 tons in 1959.

Mr. WATTERSON. On more acreage.

Senator BURDICK. That's the point I'm making. How many more acres?

Mr. WATTERSON. 290 acres of hay land in 1959 produced 280 tons of hay, where our big drop is from 1960, the last previous 2 years, if you will notice on more acreage, 390 acres of hay land, 113 tons of hay.

Senator MCGEE. That was in 1960?

Mr. WATTERSON. Yes, sir. With 60 acres of grain, 19,000 pounds, and in 1961 on 360 acres of hay land, 155 tons of hay, with 90 acres of grain was 12,000 pounds yield.

Senator BURDICK. But there must be a weather factor in 1958 and 1959 in addition to the water factor.

Mr. WATTERSON. There is quite a margin of water shortage between the two, and the weather against you, too, the drought conditions, but there is quite a variation between 1958 and 1959. We dropped off 1 foot of water.

Senator BURDICK. But you got a production of hay.

Mr. WATTERSON. We got a production of hay, but in 1960—

Senator BURDICK. Yes, I see that.

Mr. WATTERSON. The great water shortage is where we really had the drop on the hay, and the grain here. And the individual farmer here that depends solely on his farm, that has no other source of income, he can't operate, gentlemen, not in this valley under these conditions. I don't care whether he's got 400 acres or he's got 80 acres,

he still can't survive here in this valley. The men that have dairy farms here, and the ones that run sheep and cattle here, that have some other source of income, to feed what little hay that we do have, and what we can buy, will survive for maybe longer than the other people will, but the man that has to depend solely on his farm for a living, for no more than he can get out of his product, what he can raise, he can't survive.

Senator BURDICK. With 320 irrigated acres and 4 feet of water, could you survive?

Mr. WATTERSON. Yes, he could. Where a man can survive in this valley, when you are raising it for the market alone, there is not enough market here for it. You've got to offset that, you've got to raise your own cattle, your own sheep, to feed your product to. He might survive for a while, yes, but here is the way it has gone over a period of years. If there is a big production of hay, hay will go down. I've seen it sell for \$12 a ton, less than \$12 a ton here. The farmer can't raise it for that, for the operating expense he has. And his grain the same way, if there is a big crop here, he has lots of yield, his grain will go down. It sold for a dollar a hundred, a dollar and a half, he can't raise it for that, that's the way it goes, it varies.

The only way that a man can make it here in this valley is have enough stock to feed his own grain and hay to, and the dairyman here, but it comes right back again, you've got to raise it before you can operate regardless if you have stock, dairy, or what you have.

It's not a question of the land that the man has, if he doesn't have the water, he can't survive here if he doesn't have the water, just raising it here for the open market.

Senator BURDICK. Taking this 320-acre irrigated farm I mentioned a while ago, with the water supply you think is adequate, could you pay increased O. & M. charges?

Mr. WATTERSON. Yes, I believe you could, but it would depend on how much increase you would have to pay.

Senator BURDICK. Well, the increased difference between 13,000 acres and 17,500 acres, roughly 20, 25 percent increase.

Mr. WATTERSON. I would say there would be some of us that could, some of them that can't, but because a lot of the farmers that have come in here and bought these units, they have invested all the money they have, their life savings, and what I understand that the Government won't go any more with them, and the banks, you couldn't go down and talk to the bank, he'll laugh at you, and anywhere you go all over the country you can mention Eden Valley, "Well, you fellows haven't got any water," you couldn't sell this ground for 50 cents an acre here now, not to an outsider if he knew it. That's the situation we are up against.

I hope that you fellows that have come here today can help us solve this, at least we know we are on the map again, we thought for a long time that we weren't.

Senator BURDICK. I can say we want to help you.

Mr. WATTERSON. I hope you can.

Senator BURDICK. And your recommendation, then, is to keep this to 13,000 acres and what else?

Mr. WATTERSON. Well, in some parts of the country, I've talked to different land buyers, and fellows from over the country. I talked to

one man out of Kansas this year that came to my place, he said they had practically the same situation, and what they did there, they put these holes down and they had the water that was available and usable water.

The government came in and helped those fellows on the cost of putting these wells down in these pumps, and that helped their water situation there. But certain of us here, like this spring, on my farm I had 26 days of water, and 1.5 acre feet of water. Well, by the time this water got to me, my crop was so dry, when this 1 acre-foot got to me, by the time I got it watered, got over it one time, started over it a half again, I was out of water. Under those conditions I got about a third of a cut in hay, one cutting of hay, between a third and a half, that was it, because we didn't have the water long enough and we didn't have the amount of water that we should have had.

Senator BURDICK. Are there any wells, deep or otherwise, in the project area?

Mr. WATTERSON. Right south of us, southwest of us, there was an oil company put a well down there, and this gentleman, it's just hearsay on the well, some of the fellows I talked to that was drilling the well, they said at 1,500 feet they hit around 3 second-foot of water from this well. And another around 2,500 feet they hit from 3½ to 5 second-foot of water on this well. That was natural flow off of this well. This well is about, oh, I'd say, about 4 miles from the closest unit, that's Mr. Benson's unit.

Now, I understand that this water was tested, and it was usable water. And I have talked to the Salt Lake Pumping Co., they say if the water is here, there is a supply of water, a rough estimate on putting these wells down with 8- or 10-inch casing, put them under pump, diesel or electric pump, would run us somewhere, that's at 1,500 feet, would run us somewhere, each farmer, somewhere within the neighborhood of between \$8,000 and \$9,000. That's a lot of money to start off with, but if we could get this supply of water, we had this supply of water to put those pumps in, they would pay for themselves.

I have been thinking about it myself as an individual, myself, trying it. That's the first gamble you've got to take, but you can put down a test hole, they put in a test hole first, if you have got the supply of water and it's usable water, then you can go down with a bigger hole.

Senator MCGEE. Doesn't that require one additional assumption, that is, that the underground water would be a stable source?

Mr. WATTERSON. That's it.

Senator MCGEE. Because that can run low in a couple of years, 3 years.

Mr. WATTERSON. In other parts of the country that I have been around, Idaho, Utah, they have these wells set up under sprinkler systems. Some of the wells have lowered, they have had to go lower, all the way from 100 to 300 feet lower with their wells. That's been over a period of 3 or 4 years of constant pumping. But they would run half again as long as we would here, because they have a longer growing season under a pumping system.

Senator MCGEE. Has there been a study completed yet of the underground profile here?

Mr. WATTERSON. I don't know whether there has or not, but not far from us here. Take in Pinedale, in the Pinedale area——

Senator MCGEE. The chairman tells me there will be some testimony on that, let me withdraw that question for the time being.

Mr. WATTERSON. In the Pinedale area they have pumps going there now, or did this summer. We have underground water supply, whether it would be usable or not, I don't know. Mr. Coppes has a flowing well here, and there has been several artesian wells put down around the valley.

But the pump men, the Peerless pump men that I have talked to in Salt Lake, say that it can be done like it has over other parts of the country, if we have the water supply, that's the "if" but it seems to me that we could run these holes and see.

Senator HICKEY. Mr. Watterson, on the estimate you gave of \$8,000 or \$9,000 per well, does that include the initial test hole and the drilling?

Mr. WATTERSON. Yes.

Senator HICKEY. Or is it just what you would buy out of Salt Lake?

Mr. WATTERSON. The company that I talked to, just a rough estimate on it, they would put down the test hole to see if we had the water, the supply of water, and would test the water, if it was usable. And then if we did have, they would drop right back, the test hole would be around a 2- or 3-inch test hole, what I understand. Then they would drop back, if you needed a 10-inch casing, or an 8-inch casing, they tell me that from an 8 to 10, if you have the water supply, put it under pressure, would flow from 3 to 4 second-feet of water. They say they do have some of them in Utah and Idaho under a 10-inch hole that their capacity is 5 second-feet of water. That would give any farmer an ample supply of water. But that's just a suggestion, gentlemen.

Senator BURDICK. Do you know whether the State water commissioner, or water engineer, or whatever you call him in this State, has had samples of this water?

Senator HICKEY. The resources board have.

Mr. WATTERSON. There has been some samples sent in. The individual farmer here himself has sent—there has been several samples sent in on wells they have had drilled themselves for stock wells, and the individual farmer has sent them in to the university, and some of it is usable for human consumption and some of it is usable for stock consumption that isn't for human consumption. Whether that would be for irrigating use, I don't know.

Senator HICKEY. Mr. Watterson, you say that you operate with sheep. What is the size of your flock?

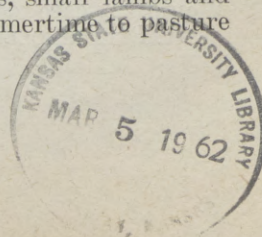
Mr. WATTERSON. We run about 4,000.

Senator HICKEY. And do you run it all on this acreage?

Mr. WATTERSON. No, we don't. It's run on the Rock Springs lease.

Senator HICKEY. What part of your unit of 480 acres is devoted to your sheep?

Mr. WATTERSON. What I do with my acreage, in the contracts when I sell to the buyers, the contracts call for 60-pound lambs, anything under 60 pounds when it's shipped, I bring them down here. Right now I've got around 600 lambs on the feed yards, small lambs and young lambs, and my bucks I keep here in the summertime to pasture on this acreage.



And my extra horses that I don't use in the wintertime, which will vary from 25 to 30 head of horses, I keep them here in the wintertime. And older sheep that have to have help during the winter, when it gets bad, I bring them in here and feed them until spring.

Senator HICKEY. Do you use it basically as a home ranch operation?

Mr. WATTERSON. That's it.

Senator HICKEY. I have no further questions.

Any further questions?

Senator BURDICK. I'm curious. I thought my father was the only fellow that had horses.

Mr. WATTERSON. Talk to all these sheepmen, they can tell you.

Senator BURDICK. Are these 25 or 30 head of horses riding horses?

Mr. WATTERSON. Well, in the summertime here we use pack outfits, each pack outfit uses from six to seven head of horses. Those horses you are not using in the wintertime, you use your work horses to your camps, and the additional horses that you have, your pack horses, you bring them in here on these farms.

Senator BURDICK. That's all.

Senator MCGEE. But your explanation for how you have been able to hang on at all on these economical units in the water shortage is, No. 1, attrition on the personal savings that were invested in the project, No. 2, the outside income that any individual may be able to arrange for otherwise?

Mr. WATTERSON. These new farmers, I think, have been hit harder than the rest of them, because they have come in here, they have invested all their money here, and they've got everything tied up. Some of them here, like some of these that were up on these units, come in here, it was 2 years before they got any crop production at all, and when they did get a crop production there wasn't any water to grow them any crops. They already had all their money sunk into it, and maybe they can survive another year, maybe they couldn't. If I was under the same conditions, I couldn't do it. I would have to close the door and walk off, and that's what is going to happen. It will eliminate itself after a while, because a lot of them can't survive another year, but that's a hard way to look at it, but it will, it will eliminate itself, because a lot of the people have moved off now, found jobs elsewhere, their farms are lying idle. We've got a lot of ground that's lying idle, because they can't afford to farm it.

Senator HICKEY. Any further questions?

(No response.)

Senator HICKEY. If not, thank you, Mr. Watterson.

Is Mr. John Hay, Jr., here? Mr. Coppes, will you advise him we will leave the record open for a statement of his?

Mr. COPPES. I will.

Senator HICKEY. Is Mr. Lynn Peckenpagh here?

The same understanding, and I will contact Mr. Peckenpagh.

I do think we have Mr. Bertognolli, who is in the financial business, I wonder if you would care, Mr. Bertognolli, to make a statement with regard to the availability of finances for this project. Would you care to make a statement, Mr. Bertognolli?

Mr. BERTOGNOLLI. What type of finances, Senator?

Senator HICKEY. The basic kind of financing that these people would need to keep them operating under the Bankhead Act, for example.

Mr. BERTOGNOLLI. We will entertain—

Senator HICKEY. Would you identify yourself for the record, please? And your business location.

STATEMENT OF WILLIAM BERTOGNOLLI, ROCK SPRINGS, WYO.

Mr. BERTOGNOLLI. Yes. These folks all know me, I'm sure. As you know, I'm William Bertognolli of the North Side State Bank at Rock Springs, Wyo.

Senator HICKEY. Do you have some loans in the area at the present time?

Mr. BERTOGNOLLI. We do.

Senator HICKEY. And over a period of years you have loaned money in this area?

Mr. BERTOGNOLLI. We have.

Senator HICKEY. You have had occasion to examine the economic situation here?

Mr. BERTOGNOLLI. We have made quite a study of it; yes, sir.

Senator HICKEY. What sources, if any, are available at the current time for financing of people operating in this general area?

Mr. BERTOGNOLLI. The only type of loan that we would be interested in at this time—

Senator HICKEY. Speaking specifically for the banking fraternity.

Mr. BERTOGNOLLI. Speaking specifically for our bank—would be the loans that are guaranteed under the Jones-Bankhead Act.

Senator HICKEY. What would be the procedure, Mr. Bertognolli, to obtain those?

Mr. BERTOGNOLLI. Those would come to us from the Farmers Home Administration.

Senator HICKEY. And that's the agency that Mr. Lynn Peckenpagh is the Director of?

Mr. BERTOGNOLLI. I believe so.

Senator HICKEY. And outside of that you basically know of no other source of financial assistance that these people might obtain?

Mr. BERTOGNOLLI. One other type. We would consider loans from dairy farms.

Senator HICKEY. Would they be chattel mortgage loans?

Mr. BERTOGNOLLI. They would. They would have to have supporting information that will enable us to make them. The information we would require was suitable feed, sufficient feed, sufficient pasture, and naturally a good herd, their membership in the co-op, inspection of the dairy barns and equipment. I might say we have looked at a few in the last year, discussed some of them, shortage of water, shortage of pastures precludes us from making the loans. There is money available, I want to stress this point, we would be happy to help out, there is money available under the Jones-Bankhead Act loans. I think there is a thing that's a media that should not be overlooked, that's a long-term loan, as you know, guaranteed by the Government, we give what we call permanent relief. There is no chance of getting short-term relief in the area under its present condition, I'm sorry, but that's the way we see it.

Senator BURDICK. In other words, your bank or no other bank that you know of will loan any money on a real estate mortgage unless it's federally guaranteed in this area?

Mr. BERTOGNOLLI. At this time, no, they would have to come a long way to change. The answer is "No" to that question.

Senator BURDICK. And you talked about the possibility of making a chattel mortgage on dairy installations, have you made any in the last 2 or 3 years?

Mr. BERTOGNOLLI. No, sir.

Senator BURDICK. That's all.

Senator HICKEY. Senator McGee?

Senator MCGEE. No.

Senator HICKEY. That's all. Thank you, Mr. Bertognolli.

Mr. Platt Wilson?

Mr. Wilson is not present. Would you contact, him Mr. Coppes, and tell him the record will be open?

Mr. COPPES. I will.

Senator HICKEY. Mr. Pete Dana. Mr. Dana, would you identify yourself and indicate your professional experience and then what your particular association with this project has been?

STATEMENT OF GEORGE F. DANA, CHIEF OF GROUND WATER DEVELOPMENT, WYOMING NATURAL RESOURCES BOARD

Mr. DANA. I am George F. Dana, I'm chief of ground water development for the Wyoming Natural Resources Board.

My particular interest in this area is that the gentlemen from the irrigation district approached the board in November of 1960 requesting additional help that the State could give them, and under this request we investigated and have made public a report on the underground water situation in the irrigation district and surrounding areas.

Senator HICKEY. And is a copy of that available?

Mr. DANA. Yes. The fact is, we have sent five to the irrigation district members here, and there are other additional copies available upon request to the board.

Senator HICKEY. Could you give the conclusions of your survey?

Mr. DANA. I would be very glad to. I will give the conclusions and then I will be glad to go back and give some of the costs which are available under this study.

Investigation of the ground water situation and possibilities of developing it for supplemental irrigation and stock supplies in the Eden Valley-Farson area has led to the following conclusions.

(a) The underground water reservoir is a confined aquifer of artesian nature and the waterflows emanate from essentially the same sandstone sequence.

(b) The artesian water has been proven to exist under two-thirds of the irrigation project and may exist under the entire project.

(c) The water has a slightly sulfurous content and odor which decreases with depth but the water is comparatively pure, averaging 750 to 800 parts per million of solids.

(d) The water is under 75 to 80 pounds of pressure and flows at 400 to 500 gallon per minute thus indicating a strong hydrostatic

head, very little drawdown, long life for the artesian flow, and a good reserve and recharge area.

(e) Wells may be drilled and completed for approximately \$7,000 each in the area if the flow does not require additional pumping.

(f) No pumping tests have been conducted in the area so that the transmissibility and storage coefficients can merely be estimated.

(g) Additional areas in which this principal aquifer has quantities of artesian water are to be the south and west.

As far north as 20 to 22 miles north of the irrigation district boundaries there is artesian water found in the lower part of this same formation. It is not the same bed which is producing water in this particular area.

Recommendations: With the above conclusions in mind, the following future program is hereby recommended if it is felt that the development of ground water is the principal solution to the existing shortage of water which now prevails in the Eden Valley-Farson area.

(a) A slim-hole test program be undertaken to determine the northern areal extent of the major aquifer both within the irrigation project boundaries and in the vicinity or drainage limits of the Big Sandy and Eden Valley Reservoirs.

(b) Further location and development of wells, which could be assumed to have artesian flows, be determined by the results of added information obtained from a slim-hole drilling program, or from observation of any future wells drilled to the immediate north of the Fred Meyes well.

(c) If immediate action is warranted in place of a slim-hole program, then wells could be drilled any place in the southern two-thirds of the irrigation district and these wells would be expected to produce considerable quantities of usable artesian water.

That ends my conclusions on that.

Senator HICKEY. I wonder, for the sake of the record, if you would adopt and permit us to insert in the record the report which contains approximately six pages, exclusive of the maps?

Mr. DANA. Yes, sir.

Senator HICKEY. And the maps that we have here could be filed?

Mr. DANA. All right, sir, that's fine.

Senator HICKEY. And this contains a cost program on page 5, which would indicate that the initial drilling expenses and the added estimated expenses per well would be approximately \$13,000-plus. You gave a figure, I think, of—

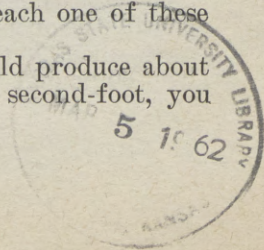
Mr. DANA. I think that is \$6,674.75 without pumping costs, sir.

Senator HICKEY. Without pumping costs. What is the possible life of such a well, or the feasibility of it?

Mr. DANA. Again, that is covered under my statement of conclusions, in which I say the water is under very high pressure there indicating a strong hydrostatic head, very little drawdown, long life for the artesian flow, and a good recharge area. At this point it would be difficult to say how long, but I would guess in the 20- to 30-year period.

Senator HICKEY. How much per acre-foot will each one of these wells provide, do you have an estimate on that?

Mr. DANA. No. I can say that if each well would produce about 500 gallons per minute, which would be about 1 second-foot, you



could average, irrigate an average of about 70 acres for that. The quality of this water, which we have not discussed yet, and which was further investigated by the people at the Wyoming University, would indicate that most of this water would be marginal, if it were used as the sole source of water for irrigation. However, if it were mixed with some of the water that was already available for it, then I would believe it would make it a much longer period of water available in the summertime. In other words, if some of this could be mixed with the irrigation water already coming into the canals, then it would probably be able to see them through the summer on it. It would add up to about 1 second-foot per well.

Senator HICKEY. But the nature of the water, in and of itself, does not permit its direct use?

Mr. DANA. That is a debatable question, because at the present time Mr. John Coppes' well, which was drilled in 1956, I believe that most of that water can be used as supplemental irrigation water, and possibly some of it could be used as a sole source, because as it stands now most of the vegetation around that well has not died, it has flourished because of the water there. Indications from this report by Mr. McNamee, let me get his title here, agricultural engineer from the Agricultural Extension Service, I will quote from his last paragraph if I may:

On the basis of the three water analysis reports appended to your report, I would hesitate to recommend the use of this water for irrigation without exploring the special management needs set forth by the U.S. Salinity Laboratory. We can discuss this further when you come over to Laramie the next time.

The previous paragraph would be interesting.

I would expect that diluting this water with reservoir water would make it safe as would the addition of gypsum. The lack of calcium or magnesium is what is destroying the quality of this water. The enclosed sheets will help explain how the classification is determined and what special practices might be needed.

Senator HICKEY. Getting back for a moment to your estimate of the flow of the water, how did you arrive at that 500 gallons per minute?

Mr. DANA. Most of it came from a combination of pressure and the size of the pipe. In other words, for instance, Mr. Coppes' well is running a 6-inch pipe that is practically full of water and is coming out about 75-pounds pressure.

Senator HICKEY. How much does it flow?

Mr. DANA. It may flow, if you put it wide open, it would flow about 550 gallons per minute, I would guess.

Is that right, Mr. Coppes?

Mr. COPPES. I don't know.

Mr. DANA. It is approximately that.

Mr. Meyers' well will flow approximately, well, will flow 400 gallons per minute plus. Mr. Mark up here, who has just finished an artesian well, there are two water zones in this particular location, the lower of which is producing at present about 50 gallons per minute, but he has shut off the upper zone, which would increase his flow about eight times. Recently he shut the well in for a 2-hour period, and after he opened the well up again the water was milky, the volume rose to about 70 to 80 gallons per minute, and the pressure went from about 60 pounds to 80 pounds, which indicates that this shut-in pres-

sure opened up some new avenues of water sources and it increased his flow from that particular zone in that well.

Now, this thickness of this artesian reservoir is about 330 feet. So there is lots of water; we'll put it that way.

Senator HICKEY. Senator McGee?

Senator MCGEE. You estimate that about two-thirds of the project, I think you say, the lower two-thirds of the project——

Mr. DANA. The southern two-thirds.

Senator MCGEE. Southern two-thirds?

Mr. DANA. Yes, sir.

Senator MCGEE. Would be able to utilize this possible underground source. When you say "the project," you are now speaking of the 17,500 acres or the 13,000 acres now being irrigated?

Mr. DANA. No, I mean the 17,500. In other words, I've taken the outline of the irrigation district as it was originally planned. In fact, probably the 20,500, or 200, whatever it was.

Senator MCGEE. Do you have any projection as to what fraction of the 13,000 acres that now receive water would be affected by this?

Mr. DANA. No, sir, I don't, because I don't know exactly how that is distributed throughout the irrigation district.

Senator MCGEE. Of course, you see the point of my question, this would have some bearing in terms of the size of the project.

Mr. DANA. Yes, sir.

Senator MCGEE. Or in terms of any wisdom of a recommendation that the project be cut in size——

Mr. DANA. Right.

Senator MCGEE. Depending on the availability of this underground water to be put on the other acreage.

Mr. DANA. Right. The recommendation there would be go north to near the northern limits of this and drill a test hole up there, then if you had water up there, then it would be only about 6 to 8 miles difference between the northernmost well at the present time and the northern boundaries of the irrigation district. Therefore, you would probably prove water between those two points.

Senator MCGEE. Did you suggest somewhere in your conclusions that there was a difference or a separate aquifer further north?

Mr. DANA. No, sir, I didn't, because Mr. Erramouspe, who has these two artesian wells north, I have requested the information but I haven't received it yet, that will come out in the form of a supplement, which is all prepared with the exception of Mr. Erramouspe's information, and will be added to this and will be sent to the holder of each of these reports. Mr. Hickey has most of the information on that in a personal letter I wrote to him 3 days ago.

Senator BURDICK. In your opinion, if this well water is mixed with this reservoir water, it would be safe to use?

Mr. DANA. Absolutely.

Senator BURDICK. In your opinion, if the well water is used alone, would it be safe in all cases?

Mr. DANA. No, sir, not safe in all cases, and it would be marginal again. I say that because the oldest well which has been drilled in this area is Mr. Coppes' well, and again the vegetation is flourishing around that well, it is not being killed by the salt content or mineral content which is present in it. The sulfurous odor can be eliminated by run-

ning the water or letting it stand. In fact, Mr. Mrak up here is using that water for household water so he must think it's adequate, and we have these water analyses to prove that that is acceptable for his use.

Senator BURDICK. I believe you testified that one well would probably take care of 70 acres.

Mr. DANA. Approximately; yes, sir.

Senator BURDICK. Then if this well water was mixed by, say, the ratio of 1 to 3, or 1 to 4, it would be safe to take care of—

Mr. DANA. I would care to say 1 to 5, that would be closer to it.

Senator BURDICK. One to five?

Mr. DANA. Yes, sir. It would increase the volume of irrigation water by about a fifth, or more if you wished.

Senator BURDICK. That would be completely safe and beneficial?

Mr. DANA. Yes, sir.

Senator HICKEY. Are there any further questions?

Senator MCGEE. This brings us back, then, to again the pertinency of the area that would have this water available, because a 20-percent increase might materially affect the 13,000-acre figure if that area was altogether within range of this supply of water.

Mr. DANA. Yes, sir.

Senator MCGEE. If it wasn't, why, it would raise another question.

Mr. DANA. Yes, sir; it certainly would.

Senator HICKEY. Mr. Dana, may we have permission to put your letter to me of 3 days ago in the record at the conclusion of your testimony?

Mr. DANA. Yes, sir; you may have. However, you have the only other copy. I wrote that to you, and if you wish to donate it to this, that's fine; yes, sir. And, also, I would be very pleased to add the supplement to the record, to, within, I hope, within a month. Now, it may be too late, or not.

Senator HICKEY. We can't hold the record open that long.

Mr. DANA. But it will be available within that time.

Senator HICKEY. If you send it to me, I'll make it available.

Mr. DANA. Fine.

Senator HICKEY. Any further questions?

(No response.)

Senator HICKEY. Thank you, Mr. Dana.

(The report referred to is as follows:)

UNDERGROUND WATER REPORT OF THE EDEN VALLEY-FARSON AREA, APRIL 1961

(By George F. (Pete) Dana, Chief of Ground Water Development, Wyoming Natural Resource Board)

1. PURPOSES AND AREA OF INVESTIGATIONS

This study was initiated as a result of the November 1960 meeting of the Wyoming Natural Resource Board. At that time, a group of ranchers representing the Eden Valley Irrigation District came before the board to seek their aid in alleviating, in some method, the lack of water available for irrigation throughout the project. They claimed that their farms would have to be abandoned if a solution could not be found.

Since there were and are known to be artesian wells present within the boundaries of the irrigation project, it was directed by the board that an investigation be made into the underground water potentials with the idea in mind of developing a further supply of supplemental irrigation water from a

subsurface source. This reconnaissance investigation was partially undertaken in December of 1960 and continued through the next 4 months.

The area of investigation is shown on map A and includes not only the estimated limits of the irrigation project but the entire area of investigation which encompasses all parts of any drainage system which could possibly be utilized to transport water from anywhere outside of the project to any point within its limits.

2. METHODS OF INVESTIGATION

A list of references employed during this study may be found in appendix A.¹ A comparison of electric and sample logs was conducted in order to establish which beds carried fluids and which of these could be expected to produce. Much data on the area was supplied by W. D. Thomas, a water well contractor from Rock Springs, who has done most of the drilling of shallow wells (up to 1,000 ft. \pm) in the area. Additional data was obtained by both personal and letter communication. An investigation trip to the area was made during the first week in March and the writer directed, by W. D. Thomas, to the locations of several artesian wells where samples were obtained for analysis. Copies of the analyses may be found in appendix B.¹

GEOLOGIC SETTING

(a) Location and structure

The area under study is found on the northeast flank of the Green River Basin which is also part of the southwest flank of the Wind River mountain uplift. The dip of the tertiary beds, which compose almost all of the surface exposures is generally to the west and southwest except when interrupted by local structural features such as the continental fault system and the Rock Springs uplift (see map B). The dip within the irrigation project boundaries is comparatively low, varying from 0 to 2°. The dip is increased somewhat both to the northeast and southeast as the uplift areas are approached, but remains low enough to allow a large area to be exposed and available for recharge from surface moisture. The fault system in the north-central part of the area has dips up to 15° as a result of its deformation and the fault itself has a displacement of 250 to 300 feet. Dips on the northwest flank of the Rock Springs uplift are up to 5°.

The surface tertiary rocks exposed in the area of investigation are composed principally of shale, siltstone, and sandstone, with minor constituents of marlstone and thin algal limestone beds. Most of the thinner sandstone bodies are discontinuous, thus making exact correlations very difficult as can be seen in the cross sections. Interfingering of the various members of formations makes the placing of formational boundaries on electric logs a highly unsatisfying task. Most of these problems are quite academic and no debates will herein be undertaken.

The tertiary strata subdivisions from the surface down are as follows: Bridger formation, Green River formation and Wasatch formation and these are discussed below.

The Bridger formation is from 150 to 200 feet thick in the Eden area but attains a maximum thickness of 357 feet where measured in Tabernacle Butte, sec. 33, T. 29 N., R. 105 W. The Bridger formation covers most of the southwest quarter of the investigation area and consists of interbedded sandstone and shale with occasional siltstone stringer.

The Green River formation is from 500 to 700 feet thick and interfingers with both the overlying and underlying strata. Its members as listed in descending order are as follows:

Morrow Creek member, 250 feet thick, shale, thin fresh water limestone, some siltstone.

Laney shale member, variable thickness, shale, some thin sandstone, and siltstone.

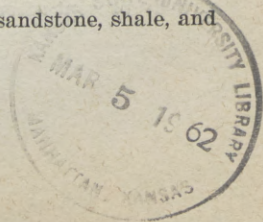
Tipton shale member, variable thickness, shale, some marlstone.

The upper part of the Wasatch formation is divided into two members as follows:

Cathedral Bluffs member, 0 to 355 feet plus-minus, sandstone, minor conglomerate and claystone.

Hiawatha member, undetermined thickness, interbedded sandstone, shale, and siltstone.

¹ Filed with the committee.



As can be seen from map B, several of the members has been mapped together as a group because their boundaries are inconsistent and many facies changes are involved. An example of this is the combining of the upper Wasatch (Cathedral Bluffs member) and lower Green River (Tipton member) into a mappable unit called the Knight formation (McGrew and Berman, 1955). The above work is comparatively recent and the new formational designation (the Knight formation) is included in the general "Wasatch" mapping unit as used on map B.

4. CROSS SECTIONS

(a) *Electric log*

An east-west electric log cross section has been constructed to point out the variations in thickness in an excellent tertiary sandstone aquifer which is believed to underly most of the irrigation district. In the western part of the map area this aquifer is about 480 feet thick and to the east it becomes a thinner and poorer aquifer.

Well 1 has 3 zones of reported artesian water, the uppermost of which correlates with artesian zones in well 3. The log shows possible minor and non-artesian water zones in the upper 200 feet of the hole.

Well 2 had no reported water but correlates with well 3 where the same zone is an excellent artesian aquifer.

Well 3 has a maximum aquifer thickness of 490 feet in the principal artesian zone. Two deeper sandstones are believed to be contributing to the total flow which is described as strong and steady but which has never been measured. An estimate for such a flow would not be too far wrong if placed at 500 plus or minus gallons per minute. Other secondary potential water sands are so designated on the log.

Well 4 is a considerable distance from well 3 but shows how the quality of the lower zone of sandstone has deteriorated due to loss of sandstone and addition of shale plus the interfingering of the two so that only three comparatively thin beds are considered as potential aquifers in this area.

(b) *Sample log*

This cross section was designed to reveal the character of the excellent artesian aquifer that is found in the area and the composition of the overlying strata.

The aquifer itself is fine to coarse sandstone with good porosity and permeability as deduced from the volumes and pressures of the waterflows. Its thickness, as estimated in well 2 and measured in well 3, is from 310 to 340 plus or minus feet and indicated no appreciable thinning to the northeast because it is measured at 300 plus or minus feet in well 4. It is difficult to project this thickness to the north because of the unpredictable nature of the facies changes in the Wasatch and Green River formations. An estimate of its minimum areal extent to the north from well 4 would be approximately a township.

5. QUALITY AND QUANTITY OF WATER

Most of the information on quality of water was derived from the sample logs and the three water analyses as found in appendix B, and the remainder from personal and letter communication.

The waters from the Bridger formation vary considerably in quality and quantity and there are certain areas where it can be used for house and domestic requirements. An excellent example of this is at the State's experimental farm (WNRB-Farson farm) where good quality water is coming from a Bridger sandstone lense from 180 to 200 feet deep. In some other places, Bridger formation water is not usable, probably because of intercommunication with beds of the underlying Green River formation. Volumes of from 10 to 50 gallons per minute may be pumped from Bridger aquifers.

The water found in the Green River beds is of no use for domestic or irrigation purposes because of a high trona brine content. The wells which penetrate Green River strata in search of a usable water supply in Wasatch beds should cease off the trona-bearing strata to prevent contamination.

The Wasatch formation sandstones, particularly those of Cathedral Bluff age, are the principal artesian aquifers in the area. Two or more water zones are usually present after the uppermost sandstone has been penetrated. The upper one or two beds contain water with a decided sulfur taste and odor. This zone is 60 to 75 feet thick and will flow about 30 to 50 gallons per minute. The sulfur

content decreases with depth and the lower two or three water zones range from a total of 60 to 200 feet of effective sandstone. These zones are capable of flowing from 400 to 500 gallons per minute.

The shut-in pressure in the Wasatch aquifer is from 75 to 80 pounds, and none of the wells which are presently flowing has shown any flow decrease.

The waters which have been analyzed from the Wasatch zones show a variance of from 572 to 940 parts per million, have some sulfurous odors, and are considered readily usable for either stock or irrigation.

6. COSTS OF DRILLING AND COMPLETION OF ARTESIAN WELLS

Estimates on drilling costs for the area were obtained from W. D. Thomas who has done about 75 to 90 percent of the water well drilling work in the Eden Valley and Farson areas. The following is a direct quote.

100 foot well at \$4 per foot.....	\$4,000.00
800 foot of 7-inch casing installed at \$2.25 per foot.....	1,800.00
Cement job.....	539.75
Total.....	6,339.75
The following added expenses are estimated:	
Valve and lead-off pipe.....	\$250.00
Miscellaneous legal work, etc.....	75.00
Total.....	6,674.75

From the above estimates, it appears that a well could be completed for not more than \$7,000.

The water obtained from the wells could probably be utilized in one of two ways as follows:

(a) Direct irrigation on owner's land, thus releasing more water for use in other parts of the project.

(b) If artesian wells can be drilled in the vicinity of the surface reservoirs, then the water could be run directly into the reservoirs on a need basis, thus keeping the reservoir at a high level throughout the year or at least during the irrigation season. This method at present has two disadvantages as follows:

(1) There is a considerable water loss from seepage and evaporation during delivery from well and/or reservoir to landowner's headgate and (2) it has not yet been established that the aquifer and artesian water may be found far enough north to provide gravity drainage to the principal reservoirs after the artesian waters have flowed to the surface of the ground.

The former method of water distribution is probably the most expensive because more wells would have to be drilled because of the present land holdings. One well flowing at 500 gallons per minute could irrigate approximately 70 acres using the 1 to 70 formula of the State of Wyoming. At the cost of \$7,000 per well, the resultant cost per acre for this supplement irrigation water would be about \$100. The most practical solution would be a number of artesian wells flowing directly into the reservoirs. A combination of the two methods would be ideal for insuring an adequate supply of water at any time during the year.

7. CONCLUSIONS

Investigation of the ground water situation and possibilities of developing it for supplemental irrigation and stock supplies in the Eden Valley-Farson area has led to the following conclusions.

(a) The underground water reservoir is a confined aquifer of artesian nature and the waterflows emanate from essentially the same sandstone sequence.

(b) The artesian water has been proven to exist under two-thirds of the irrigation project and may exist under the entire project.

(c) The water has a slightly sulfurous content and odor which decreases with depth but the water is comparatively pure, averaging 750 to 800 parts per million of solids.

(d) The water is under 75-80 pounds of pressure and flows at 400-500 gallons per minute thus indicating a strong hydrostatic head, very little draw-down, long life for the artesian flow and a good reserve and recharge area.

(e) Wells may be drilled and completed for approximately \$7,000 each in the area if the flow does not require additional pumping.

(f) No pumping tests have been conducted in the area so that the transmissibility and storage coefficients can merely be estimated.

(g) Additional areas in which this principal aquifer has quantities of artesian water are to the south and west.

8. RECOMMENDATIONS

With the above conclusions in mind, the following future program is hereby recommended if it is felt that the development of ground water is the principal solution to the existing shortage of water which now prevails in the Eden Valley-Farson area.

(a) A slim-hole test program be undertaken to determine the northern areal extent of the major aquifer both within the irrigation project boundaries and in the vicinity or drainage limits of the Big Sandy and Eden Valley Reservoirs.

(b) Further location and development of wells, which could be assumed to have artesian flows, be determined by the results of added information obtained from a slim-hole drilling program, or from observation of any future wells drilled to the immediate north of the Fred Meyers well.

(c) If immediate action is warranted in place of a slim-hole program, then wells could be drilled and placed in the southern two-thirds of the irrigation district and these wells would be expected to produce considerable quantities of usable artesian water.

Respectfully submitted,

GEORGE F. (PETE) DANA,
Chief of Ground Water Development.

MEMORANDUM

To: Senator J. J. Hickey.

Subject: Supplemental information to be added to Eden Valley-Farson underground water report.

The information contained in this memo will be added to the Eden Valley-Farson underground water report in the near future in the form of an addendum. It is a collection and interpretation of facts which have come to light since the original report was compiled in April of this year. There are a few revisions or clarifying statements contained herein concerning the quality of the major underground waters and some data on additional well drilling.

NEW WELLS

(a) Oil and gas: In the NE. NW. of section 2, T. 24 N., R. 103 W., Shell Oil Co. drilled their second plunge unit well late this summer. No water flows were found in the well and if any minor fluid zones were present, the water was controlled by either the surface casing or the weight of the drilling mud.

(b) Water: On June 21, 1961, Vernon A. Mrak completed an artesian well on his ranch which is about a mile north and west of Farson and specifically located in the SW. NE. of section 21, T. 25 N., R. 106 W. (Both of the above wells may be added to map A of the original report.) Two principal water zones were encountered at 728-770 feet and 890-960 feet in Mr. Mrak's well. The upper of these was cased off because of the preferable quality of water in the lower zone. The initial flow of the completed well was 50 gallons per minute and the shut-in pressure was 58-60 pounds.

On the 30th of September, the well was shut in for 2 hours. When opened up again, the pressure had increased to 80 pounds, the volume had increased to 60-70 gallons per minute, and the water was somewhat murky. These facts suggest that the back pressure which was built up during the 2-hour shut-in period was sufficient to open new passages in the producing sandstone and cause increases in both volume and pressure.

Mr. Mrak's present use for the water is household, livestock, and minor irrigation in the immediate vicinity of the well. A chemical analysis of the water quality is herewith attached.

The cost of drilling and completion was about \$3,969 because Mr. Mrak used his own rotary drilling equipment. A realistic figure for this and similar wells in the area would be around \$7,000 based on a \$4 per foot drilling cost.

QUALITY STUDIES

On September 21, I received correspondence from Michael A. McNamee, agricultural engineer at the Agricultural Extension Service in Laramie. He had read the original Eden Valley underground water report and expressed his concern over the statement on page 4, that the analyzed waters from the Wasatch formation "are considered readily usable for either stock or irrigation."

His examination of the chemical constituents of the water and the classification of the well water as to agricultural requirements showed that, although the parts per million of solids was acceptable, the water was not rated as good from a chemical and agricultural standpoint. He added that, in order to use the water for irrigation, it could be diluted with ditch water or gypsum could be added to it to increase the calcium and magnesium content. He also stated that the soils which receive the water should have excellent drainage and contain a small percentage of clay particles.

Our office is grateful to Mr. McNamee for his help in this type of analysis because our board does not have that kind of technical knowledge. In the future, we will contact him for this type of valuable detailed analyses on other areas in the State.

The USGS has had some water analysis work done in the area and have come up with essentially the same quality ratings. Their analyses have not been published to date.

Further ideas on the usability of the waters may be obtained from observing the artesian waters at the Farson store and the Hays Ranch, south of Eden. Very little killing effect on the surrounding vegetation is evident and these wells have been flowing for several years. A thin crust of alkaline or salt material is present at the well sites, part of which could possibly have come from either the surrounding soil or from the flowing water. The other artesian wells in the area are too new to show any detrimental effects in the area immediately adjacent to the well location.

In my letter of thanks to Mr. McNamee, I make the following statement:

"Although it was not directly stated in the report, the artesian waters in the area should be used as a supplemental supply, could be mixed with the presently available irrigation water, and should not be used or developed as the only supply of waters for irrigation."

The two principal letters of correspondence and an irrigation water classification chart may be found attached hereto.

FUTURE DATA

The completion and mailing of the addendum is awaiting additional data from a sheep rancher named Gaston Erramouspe whose land is located 20-plus miles north of Farson. Two artesian wells have been drilled on his ranch and the details of this drilling, completion, and present production have been promised us by Mr. Erramouspe.

It is known that the source of the water is lower in the Wasatch formation than the waters in the Farson area because the top of the Wasatch formation is very close to the surface in the Erramouspe area. The depths to the artesian water bearing strata in both areas are comparable. If more than one addendum seems to be warranted because of future underground water development, the resource board will assume the same type of responsibility in presenting the additional information as they have with the original report and the first addendum.

Respectfully submitted.

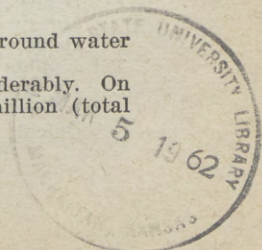
GEORGE F. (PETE) DANA,
Chief of Ground Water Development,
Wyoming Natural Resource Board.

SEPTEMBER 21, 1961.

Mr. GEORGE F. DANA,
Wyoming Natural Resource Board,
Cheyenne, Wyo.

DEAR PETE: I received two copies of your report on the underground water resources in the Eden-Farson area. Thanks for sending them.

In reading the report I ran across an item that disturbs me considerably. On page 4 you state that the waters vary from 572 to 940 parts per million (total



solids) and are considered readily usable for irrigation. Further analysis of the water sample, however, indicates that nearly all of the salts are sodium salts which throws this water into class 4 water from an alkalinity standpoint. I'll explain.

There are three primary factors which influence irrigation water quality; alkalinity, salinity, and residual carbonates. Alkalinity is based on the sodium absorption ratio according to the formula: $SAR = \frac{Na^+}{\sqrt{Ca^{++} + Mg^{++}}}$ (used milliequivalent per liter). Salinity is based on the electroconductivity of the water in micromhos per centimeter ($EX \times 10^6$) at 25° C. The residual carbonates are based on the formula $(CO_3^{--} + HCO_3^-) - (Ca^{++} + Mg^{++})$ again using milliequivalent per liter as the base.

On this basis, all the water you show an analysis for in your report would be rated as class 4 from the standpoint of alkalinity, class 3 from the salinity standpoint, and class 3 by residual sodium carbonate (two wells, one well is class 2). Any one of these classifications would indicate marginal suitability of the water for irrigation except under special management and soil conditions.

The waters could only be used on soils where there is a very small percentage of clay particles and where drainage is excellent. Application of excess water would be necessary to provide leaching.

I would expect that diluting this water with reservoir water would make it safe as would the addition of gypsum. The lack of calcium or magnesium is what is destroying the quality of this water. The enclosed sheets will help explain how the classification is determined and what special practices might be needed.

On the basis of the three water analysis reports appended to your report, I would hesitate to recommend the use of this water for irrigation without exploring the special management needs set forth by the U.S. Salinity Laboratory. We can discuss this further when you come over to Laramie the next time.

Sincerely yours,

MICHAEL A. McNAMEE,

Agriculture Engineer, Agricultural Extension Service.

Member company -----

Operator: Leonard Hitchew.

Well No. 1: Vernon Mrak.

Field: Wildcat.

County: Sweetwater.

State: Wyoming.

Date: July 3, 1961. Report No. -----

Location: Sec. 21-25N-106W.

Formation: Tertiary-Wasatch-Cathedral Bluffs.

Depths: 890-960.

Sample from -----

Description of sample -----

Constituents	Milligrams per liter	Milliequivalent per liter	Milliequivalent percent
Sodium.....	218	9.47	50.00
Calcium.....	(1)		
Magnesium.....	0		
Sulfate.....	95	1.98	10.45
Chloride.....	32	.90	4.75
Carbonate.....	96	3.20	16.90
Bicarbonate.....	207	3.39	17.90
Hydroxide.....			

¹ Trace.

Observed pli.....	8.8
NaCl equipment.....	474
Resistivity at 68 F., ohm-meters:	
Measured.....	11.70
Calculated.....	12.00
Total solids in parts per million:	
By evaporation.....	541
After ignition.....	536
Calculated.....	543

Properties of reaction in percent:

Primary salinity	30.40
Secondary salinity	0.00
Primary alkalinity	69.60
Secondary alkalinity	0.00
Chloride salinity	31.25
Sulfate salinity	68.75

UNIVERSITY OF WYOMING, AGRICULTURAL EXPERIMENT STATION, PLANT SCIENCE DIVISION

IRRIGATION WATER CLASSES

Salinity

- Class C1, low salinity: Good water with little or no likelihood of salt accumulation under the leaching provided by average irrigation practices, except where subsurface drainage is inadequate.
- Class C2, medium salinity: Can be used if a moderate amount of leaching occurs. Plants with moderate salt tolerance can be grown in most cases without special practices for salinity control.
- ✓ Class C3, high salinity: Cannot be used on soils with restricted drainage. With adequate drainage, considerable excess water must be applied each irrigation, irrigations made more frequently, and plants with a good salt tolerance should be selected.
- Class C4, very high salinity: Not usable under ordinary conditions. On very light and permeable soils with excellent drainage, water may be usable with large amount of excess leaching water, frequent irrigations, and very salt tolerant crops.

Alkali

- Class S1, low sodium: Good for almost all soils, and all Wyoming crops.
- Class S2, medium sodium: Can cause alkali problems on heavy clayey soils, with low leaching, unless gypsum (or equivalent soil amendments) are present or added to the soils.
- Class S3, high sodium: May create harmful levels of exchangeable sodium in all soils and will require special management—good drainage, high leaching, and organic matter additions. Soils containing natural gypsum may not develop alkali troubles. Chemical amendments may be necessary, but are not feasible with waters of very high salinity.
- ✓ Class S4, very high sodium: Generally unsuited for irrigation. Special conditions of low salinity water, favorable gypsum content of soils, tolerant crops, and special management, may permit use of these waters.

Residual sodium carbonate (possible future alkali problems)

- Class 1, safe (<1.25): No problems other than those given for the alkali rating anticipated.
- Class 2, marginal (1.25–2.50): Possibility of some increase in alkali accumulation over those listed under alkali.
- ✓ Class 3, not suitable (2.50 $<$): Considered nonusable for irrigation under most circumstances.

Boron

Information is incomplete on this component of irrigation waters. The following ratings are tentative:

	<i>Sensitive crops</i>	<i>Semitolerant crops</i>	<i>Tolerant crops</i>	
Class 1	-----	-----	-----	No yield depression expected.
Class 2	-----	-----	-----	Slight yield depression expected.
Class 3	-----	-----	-----	Strong yield depression expected.
Class 4	-----	-----	-----	Nonusable or very strong yield depression expected.

Selenium

Information is incomplete on this component of irrigation waters. The following ratings are tentative:

- Class 1, low: No plant toxicity anticipated.
- Class 2, medium: Usable-possible long-term accumulation under particular conditions, and should be watched.
- Class 3, high: Doubtful usability—probably toxic accumulation in plants, except under especially favorable conditions.
- Class 4, very high: Nonusable under any conditions.

Remarks:

SEPTEMBER 27, 1961.

MICHAEL A. McNAMEE,
Agricultural Engineer, Agricultural Extension Service,
Laramie, Wyo.

DEAR MIKE: I appreciate very much your further work on the Eden Valley-Farson water analyses as you have described it to me. I do not have the background to have made this analysis myself and thus welcome your research and recommendations.

I did talk to at least two different parties concerning this water for supplementary use, but again, they might not have had the technical knowledge to classify it as you have done. At the time the report was compiled, our office was not aware of the help that you would be able to give us concerning agricultural use. Bruce inadvertently overlooked informing me of this possibility and on further projects, we hope you will be available for consultation before any positive statements are made.

Although it was not directly stated in the report, the artesian waters in the area should be used as a supplemental supply, could be mixed with the presently available irrigation water and should not be used or developed as the only supply of waters for irrigation.

I plan on writing up an addendum to the report as soon as I get some added information which I am now attempting to obtain and your data and conclusions will be incorporated into the addendum.

This is an excellent example of how State agencies can and should be able to aid each other in the technical interpretation of available facts and figures.

I am looking forward to visiting Laramie in the near future, and will be most happy to go over this subject again.

Yours very sincerely,

GEORGE F. "PETE" DANA,
Chief of Ground Water Development.

STATEMENT OF JOHN WOOD

Mr. Wood. Honorable Senator, my name is John Wood. I came to Eden Valley from Missouri in May of 1926 and went to work as a farmhand for the late Ivan H. Dearth the 1st day of June 1926.

In 1928 I hired out to the Blair Hay, Land & Livestock Co. I plowed most of the present farm out of sagebrush, I leveled it to a certain extent, using my eye and experience for a level. Today that farm is one of the outstanding farms for production if it has water.

Our situation is like this: If someone was out of gas and I just had enough gas in my tank to get to town and I gave him half of mine, neither of us would get to town. That applies to our watershed. It only produced enough water for the acres already here and giving half to the new acres, none will get to town. What base the Bureau officials are using I don't know. This is not an act of God as they would have you believe, but an act of the Bureau of Reclamation. We had short years prior to the Bureau coming in and several of them 1932-34, 1935, 1940, 1942 and 1943.

Foundation of our laws are based on justice and I cannot believe it is fair or justified for ones with an adjudicated water right to have to share with more acres and all go broke.

Are we going to have to force an issue for our water or does a water right mean anything? If not why are they issued?

I have 120 acres with adjudicated water rights. I bought some supplemental acres, 67 leveled for irrigation, a quit claim deed for the land is all I have. I feel the Bureau of Reclamation should get this new acreage more water or reimburse them for their mistake.

I commune with God and I never like to blame Him for my mistakes. I would like to refer you to the 121st Psalm and I quote:

I will lift up mine eyes unto the hills from whence cometh my help. My help cometh from the Lord which made Heaven and Earth.

Those hills are instruments of God and have meant a lot to us old-timers. The fourth day of July if we could look up and see seven points of snow, we knew we would have a crop, while that tradition doesn't mean a thing now with these extra acres. Back history doesn't merit putting more acres in. It would seem to me if Congress is going to let the Bureau continue, have them consider the human side of things.

In closing I would like to leave this thought: "People are ruled by words and if words be truth the truth will make us free, thus saith the Lord."

Thank you.

Senator HICKEY. That concludes the testimony of the witnesses that have been requested today, and, as has been previously indicated, transcripts will be made. The record will be kept open for how long, Mr. Whitacre?

Mr. WHITACRE. We can keep it open for 2 or 3 weeks.

Senator HICKEY. Two or three weeks. Tomorrow morning I will get Mr. Peckenpagh's testimony. I imagine he will be in Riverton.

Mr. COPPES. Senator, I will contact Mr. Wilson at Kemmerer.

Senator HICKEY. Mr. Wilson interested me in this when I was Governor, when a group came down with you and testified before our natural resources board, which subsequently brought about the matter that Mr. Dana has testified to.

Senator MCGEE. Would it be fair to say, Mr. Chairman, that anyone who has testified today that either has any second thoughts, or something occurs to them that they did not volunteer here, that the record would still be open to have their statement amended to include those?

Senator HICKEY. For at least 2 weeks.

Senator MCGEE. If there are those who didn't come prepared to testify, if they feel that they have something to enrich this record, they would likewise have that privilege?

Senator HICKEY. They may, and certainly if they will direct it to Mr. Coppes he will put it in our hands.

I would like, on behalf of the committee, to certainly thank the ladies who were so nice to us today, and fed us so very well, and certainly appreciated the attendance of all the interested people, and say to you that at the time when this record is completed, the entire committee will be acquainted with it, have an opportunity to read it, and attempt to work something out with the interested agencies as quickly as possible. If legislation is required, certainly we will move in that field.

Mr. COPPES. Senator, if I may, before you close, Mr. Dana, in his testimony on these wells, I would like to elaborate a little bit more on our well, which is the first well that was drilled that had a good quantity of water.

Senator HICKEY. This is Mr. Coppes testifying.

STATEMENT OF JOHN A. COPPES—Resumed

Mr. COPPES. I would like to add on to that that our well is 1,030 feet deep, and has water sand for 390 feet. We struck the first water at 740 feet, and first artesian, and we continued until we stopped drilling, and when we started hitting shale again at 1,030 feet. We hit three different water sands, that is, increases of water during the time we drilled, but I want to say this: That you people are aware of the fact that we have a water right underground as well as you have on your surface water.

Senator HICKEY. I helped draw that law.

Mr. COPPES. So I want to make this plain, that I have my well and I have an adjudicated water right for that well, and regardless of who drills wells, and so forth, if my water supply starts going down I'm going to start climbing.

Senator HICKEY. You have a cause of action.

Senator BURDICK. I've got a very important question. The artesian well that we have up in Williston, my hometown in North Dakota, we can't make coffee out of it. Can you make coffee with your water?

Mr. COPPES. Sir, we use that water for all our domestic use. The State of Wyoming sent us back a sample of water and said, "If you can stand the smell of it, it's good for human consumption."

Senator HICKEY. Senator McGee?

Senator MCGEE. Yes, Mr. Chairman. I would like to thank you and Senator Burdick for letting me sit in as a kibitzer with the Interior Committee, and I will make every effort to run whatever interference is necessary once your committee makes a determination on the basic conditions of this question, because it probably is going to take some money in any case.

I think the thing that has come through very loudly and clearly here today is it's two-edged, and that is that the problem, itself, is long range and not one of a temporary drought-induced circumstance, a long-range problem, but that the urgency of the economics in it is very short range; namely, we've got to act fast, because of the accumula-

tion of marginal economics that's already taking a very serious toll from the resources of all of those who are attempting to sustain themselves in these units here in the Eden-Farson project.

I want to thank you all for the hospitality that you have shown here, it's been wonderfully refreshing, and I want to assure you that this is typical of the wonderful State of Wyoming. [Applause.]

Senator BURDICK. And I, too, would like to thank the people of Wyoming for the kindness and the consideration and the hospitality you've shown me here today, and I want to say that I have been working in the past, will continue to work with your two fine, able Senators, and if there is anything we can do in the committee to help you out of this situation we will surely do all we can. As Senator Hickey has said, the report will go to the full committee, and knowing the committee as I do I know they will give this full and fair and complete consideration. [Applause.]

Senator HICKEY. Just a moment before we close the record, I would like to acknowledge the presence here of some observers from the Bureau of Reclamation. Would they identify themselves?

Mr. HOLLIS HUNT. Hollis Hunt from the Bureau of Reclamation, regional supervisor, Salt Lake City, region 4.

Mr. PAUL TAYLOR. Paul Taylor, Bureau of Reclamation, Rock Springs, project manager.

Senator HICKEY. And are there others?

Mr. BLAIN RICHARDS. I am Blain Richards from Rock Springs.

Senator HICKEY. Are there any other Bureau of Reclamation people?

(No response.)

Senator HICKEY. I will assure you when the record is made up, if testimony of the Bureau of Reclamation is required, we undoubtedly will take that in Washington without taking the time here to do it.

Mr. JUD THOMPSON. I am Jud Thompson and there is one thing that wasn't brought out by our water commissioner or the Bureau today that I don't know how they arrived at the 13,000 feet.

Senator MCGEE. You mean 13,000 acres.

Mr. THOMPSON. Acres, yes. We have, in the last 2 years, just completed 63 reservoirs, and there is approximately 125 reservoirs between here and the mountains on our watershed.

Senator HICKEY. Stock water? Is that stock water reservoirs?

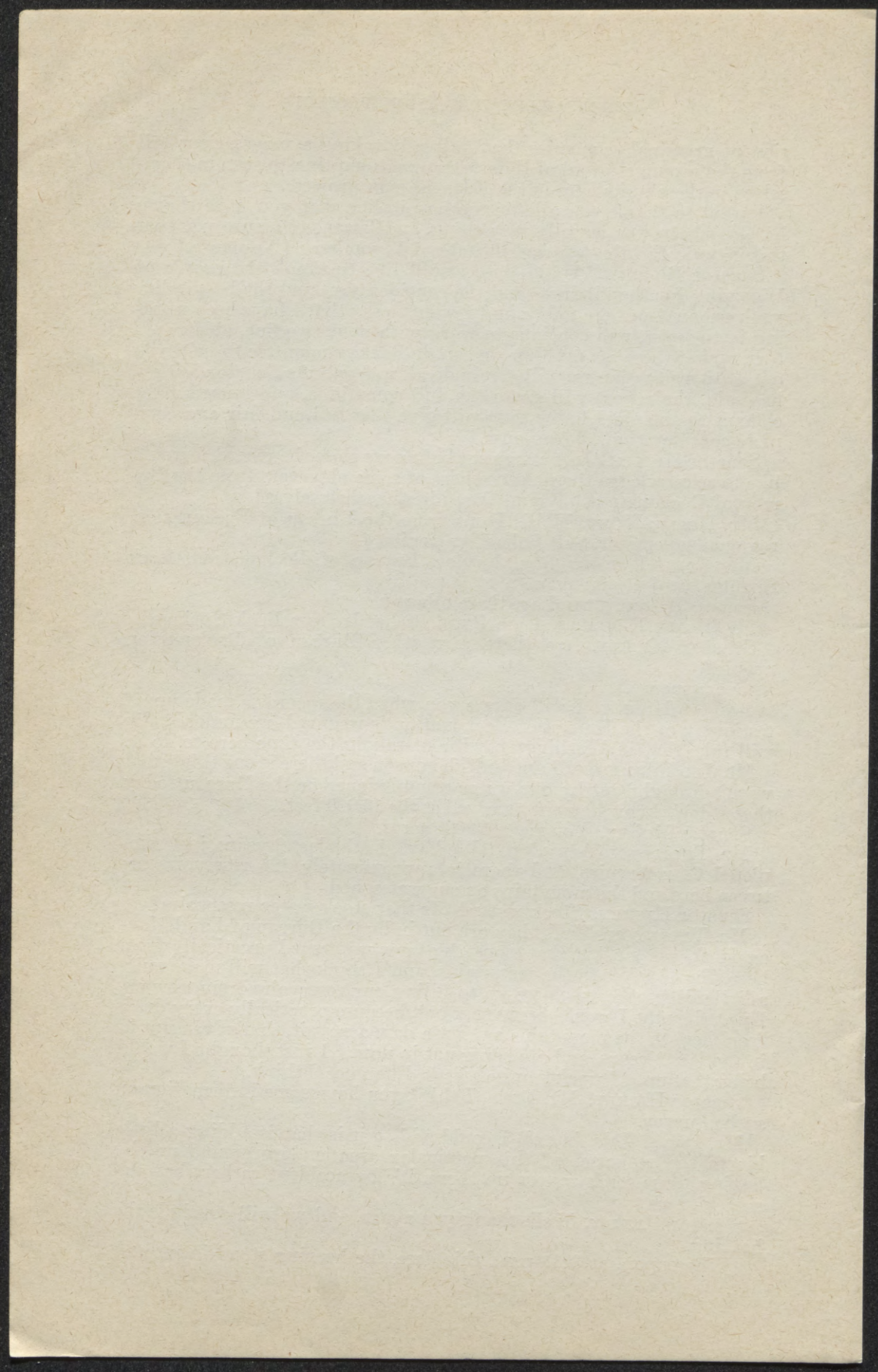
Mr. THOMPSON. Well, they are put in by the Bureau of Land Management, yes, sir, but that stops all of our watershed practically from here, for 36 miles to the mountains, and I think that will make quite a little difference when we go to filling our reservoirs from now on. I just thought I would bring that out, because practically every draw from here to the mountains has got a dam across it, that's been put in in the last 2 years, and are being put in now. I just thought I would bring that up. It makes quite a little difference, I think.

Senator HICKEY. Mr. Dana, I think you have some information on such a survey.

Mr. DANA. I do, but all I could add to it is that is adding a little bit to the recharge of this particular area underground here, by having those stock waters up there, it's by accident rather than design, though.

Senator HICKEY. Well, thank you again, and we will conclude the hearing.

(Whereupon, at 3:15 p.m., this date, the hearing stood in recess.)



EDEN VALLEY IRRIGATION AND RECLAMATION PROJECT

OCTOBER 31, 1961

U.S. SENATE,
SUBCOMMITTEE ON IRRIGATION AND RECLAMATION,
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
Riverton, Wyo.

Whereupon, at 9:30 a.m., October 31, 1961, at the American Legion Home, Riverton, Wyo., the following proceedings were had:

Senator HICKEY. This is a continuation of the testimony taken yesterday at Farson, Wyo., and is now being taken at Riverton, Wyo., at 9:30 a.m., on October 31.

Would you identify yourself for the record, please?

STATEMENT OF WILLIAM "SCOTTY" JACK, MEMBER, BOARD OF EQUALIZATION AND PUBLIC SERVICE COMMISSION, STATE OF WYOMING

Mr. JACK. I am William "Scotty" Jack, a member of the Board of Equalization and Public Service Commission of the State of Wyoming.

Senator HICKEY. Have you had an opportunity, Mr. Jack, to examine the area which is known as the Farson or Eden Valley area which encompasses a reclamation project of some 17,000-plus acres located in Sweetwater County with regard to the assessed valuation effect upon the tax picture in the State of Wyoming?

Mr. JACK. Yes, sir.

Senator HICKEY. Would you elaborate on the conclusions of your observations?

Mr. JACK. I am speaking from the annual report, 1961, of the State Board of Equalization of the State of Wyoming. Total valuation of Sweetwater County is \$83,872,467. The valuation of school district 21, in which the Eden Valley project is located, is \$1,086,481. The percentage ratio of those two valuations is 0.012955 percent.

You want to be clear and understand that that is the total valuation of school district 21, it is not the valuation of the lands that are involved in the Eden Valley project.

It is our opinion that the taxable valuation of the Eden Valley lands involved in the project is a small percentage of the taxable valuation of school district 21. So you must understand that the figure of \$1,086,481 is not only the valuation of the lands in school district 21, which includes the lands of the Eden Valley project, but is also the valuation of all the livestock, all the farm machinery, and other properties taxable under our ad valorem system in Wyoming.

Senator HICKEY. Would you have any idea of what portion of school district 21 the Eden project makes up?

Mr. JACK. No. We were not able to pin it down to that fine a point.

Senator HICKEY. You don't have the acreage of 21?

Mr. JACK. No; not here in this record, because we were dealing only with the overall taxable property. Our opinion is, of course, that it's a very, very small percentage overall compared to the total in Sweetwater County, very small.

Senator HICKEY. And perhaps would not affect the overall tax structure of the county?

Mr. JACK. It would have very, very little detrimental effect, very little, negligible.

Senator HICKEY. Thank you, Mr. Jack.

Mr. JACK. I'm very happy to be of service to you, Senator; if there is anything in these records that you would like to have, we would be glad to give them to you.

Senator HICKEY. I think I will probably want to get a copy of the one you just testified from.

Mr. JACK. I'll be glad to turn it over to you. Thank you.

(Whereupon, at the hour of 9:40 a.m., this date, the hearing was closed.)

APPENDIX

(The following communications and statements were subsequently submitted:)

STATEMENT OF PLATT WILSON, KEMMERER, WYO.

The Eden project was originated in 1907 under the Carey Act by the Eden Irrigation & Land Co. Of the withdrawal of 95,653 acres of land, only 28,336 acres were patented to the State, and 13,882 acres were covered by water right sales which were first sold for \$30 an acre but later the price was raised to \$50. The original company went into receivership in 1927 and the title passed successively to the Rock Springs Water Co. and the Wyoming Land & Water Co. and when the latter company was bankrupt the title of the project wound up in the Department of Agriculture.

Lands under the old project were supplied with water from the offstream Eden Reservoir which received water through supply ditches from the Big Sandy and Little Sandy streams. The reservoir is reported to have been operated at a capacity of 16,000 acre-feet but with unsafe freeboard allowances. The Bureau of Reclamation now reports it has an active capacity of 7,200 acre-feet. The lands in the old project also have direct flow water rights from the Big Sandy River with a priority of 1903. There were also three smaller reservoirs up in the Wind River Mountains having a total capacity of 2,460 acre-feet. Another reservoir was contemplated at the Leckey site above the present Big Sandy Reservoir. It was to be supplied from the Big Sandy and also from imported water from East Fork River. This reservoir was never built.

The present Eden project was approved by the President for construction in 1940 and the Bureau of Reclamation was designated as the construction agency. Plans called for the construction of the Big Sandy Reservoir on the Big Sandy River to have a capacity of 39,700 acre-feet and the Means Canal to convey water to the lands in the project. The old Eden Reservoir was to be abandoned.

The Civil Conservation Corps did some work on the dam for the Big Sandy Reservoir in 1941 and 1942 but the work was called off on account of the war.

Completion of the project was again authorized in 1949 as a participating project of the Colorado River storage project if and when that project would be authorized by Congress. The Bureau of Reclamation was to continue the work. The Soil Conservation Service was given the responsibility of completing the land development and the settlement of the project.

The plan of development was to irrigate 9,700 acres of old irrigated lands which had received water from the old project and 10,660 acres of new lands. About 20,000 acres. This has been now reduced to 17,000 acres by the Bureau of Reclamation. It is my understanding that the owners of the lands under the old irrigation system are to pay the same construction charges per acre as the new settlers on the new lands of the project.

As in most Government reclamation projects now being constructed in the West, the settlers on the project were to pay what they could afford to pay of the construction cost of the project. In this case it was to be \$75 per acre and with the 20,000 acres first contemplated the total amount paid by the settlers was to be \$1,500,000, but if less than 20,000 acres were developed then the total amount of \$1,500,000 was to be reduced proportionately. Now with the project reduced to 17,000 acres, this payment by the settlers amounts to \$1,275,000.

The profits from the sale of power developed on the Colorado River project dams and powerplants are to pay the rest of the construction costs. The total cost of the construction of the project was about \$8 million. The original estimate was \$7,287,000 for construction. Estimated cost for land development was \$1,531,000.

The soil on the Eden project is a sandy loam varying considerably on different localities of the project. The eastern part of the project being considerably sandy requires a subirrigation system. Here water is run into the distribution ditches and allowed to soak into the soil instead of being run over the surface as in most cases.

Estimates of the water required to properly irrigate the lands on this project vary considerably and runs from 3.03 acre-feet per acre to as much as 5 acre-feet per acre at the point of diversion from the reservoir or stream. On page 3 of Bureau of Reclamation Summary Statement Concerning Water Use and Related Matters on the Eden Project as was furnished to Senator Joseph C. O'Mahoney by Commissioner Floyd Dominy on February 2, 1960, the figure of 4 acre-feet per acre is used in the calculations and said to be sufficient at the diversion point. This with a conveyance loss between the reservoir and the farm headgate of 0.97 acre-feet will leave a delivery at the farm headgate of 3.03 acre-feet per acre.

Several of the irrigators on the project say they need a delivery of 4 acre-feet per acre at the farm headgates. This, then, means a diversion of 5 acre-feet per acre at the diversion point on the stream.

The loss in transportation of 0.97 acre-feet per acre is the estimate made by the Bureau of Reclamation.

With a requirement of 4 acre-feet per acre at the diversion point then for 17,000 acres the required amount to irrigate the district would be 68,000 acre-feet per year.

If 5 acre-feet per acre is required to irrigate the project then the requirement is 85,000 acre-feet per year.

The Bureau's report states that all the acres on the project probably will not take water each year and in that case the amount would be reduced as much as that required to irrigate 1,000 acres or 4,000 acre-feet or perhaps 5,000 acre-feet.

Measured just above the Big Sandy Reservoir the flow of the Big Sandy River averaged 62,700 acre-feet per year for a period of 39 years. The average yearly flow of the Little Sandy Creek measured just above the point of diversion of the Eden Reservoir Supply Canal is 15,900 acre-feet. These stream measurements covered a period of 39 years from 1921 to 1959. Some are actual stream measurements and where actual measurements could not be obtained a correlation was made with other streams where similar conditions exist. The Bureau estimates that only about 9,500 acre-feet could be diverted from the Little Sandy Creek per year for use on the project.

This then makes a total average of 72,200 acre-feet available from the two streams per year.

With a diversion of 4 acre-feet per acre per year for 17,000 acres or a maximum diversion of 68,000 acre-feet per year then there will be an average oversupply of 4,200 acre-feet per year.

If a diversion of 5 acre-feet per acre per year is required then an average of 85,000 acre-feet per year will be required. Then there will be a shortage of 12,800 acre-feet.

There just isn't enough water in the two streams to supply enough water to irrigate the project with a diversion of 5 acre-feet per acre per year.

The above figures do not take into consideration the evaporation that will occur on the reservoirs. I understand no figures have been obtained as to how much evaporation is on the Big Sandy Reservoir. However, the evaporation on Pathfinder Reservoir in central Wyoming is said to be about 4 feet per year. At this rate the maximum evaporation on the Big Sandy Reservoir, with the reservoir full the year round would be about 10,000 acre-feet.

But since the reservoir is not expected to be full except in the spring and early summer the evaporation will be much less. An extensive study will be necessary to determine just how much.

Of the 12,964 acres on the project under cultivation in 1959, on account of the short water supply that year, only 2.2 acre-feet or about 73 percent supply was delivered to the lands. All the farm units had not yet been sold. A delegation of water users from the Eden project appeared at the hearing held in October 1959 at Laramine held by Senator Kerr, on water resources, and asked that further sale of farm units on the Eden project be stopped. This delegation presented the fact that there was not enough water to supply all of the 17,000 acres still in the project. But by the spring of 1960 all the farm units except one had been sold. Four had not yet been moved onto. This was another short water supply year and the water was shut off early in July.

The elevation of the project is 6,500 feet above sea level.

The growing season for frost-resistant crops is given in the Bureau report as 124 days. Until March 1945 the Wyoming legal limit for the diversion for water was 1 cubic foot per second for every 70 acres. One cubic foot per second amounts to about 2 acre-feet per day. In 124 days this would amount to 248 acre-feet for every 70 acres or 3.54 acre-feet per acre. I have heard many ranchers complain that this is not enough. In 1945 the legislature increased the legal limit to just double the original amount provided the water was in the stream and unappropriated.

Several plans have been suggested for a remedy to the water shortage situation on this project. Among them were—

Importation of water from neighboring streams: The Bureau of Reclamation made a study of importing water from East Fork River which is just to the north of the Big Sandy River about 6 to 12 miles where the two streams flow out of the Wind River Mountains. They reported that a canal to bring water from East Fork to the Big Sandy would cost about \$1,500,000. They estimated that about 10,000 acre-feet might be available.

Pacific Creek, a small desert stream just to the south of the Little Sandy might furnish about 1,000 acre-feet.

More reservoir space: Raising the Big Sandy Dam or securing other sites or rehabilitating the old Eden Dam and Reservoir were suggested with the idea that if all the surplus water flowing down the two streams during the high water years could be stored and held over for use in the short water years a very considerable relief would be had. While some considerable evaporation loss would be had in carrying water over from year to year this is a practice made in several of our storage projects. In the summer of 1960 the Seminole Reservoir had a 4-year supply for the Kendrick project near Casper. The large storage dams on the Colorado River project are planned for the purpose of holding the excess water over and above the 7,500,000 acre-feet per year that must be delivered by the Upper Basin States at Lee's Ferry for use in the Lower Basin States and plan to carry this water over for as many years as necessary so that they can deliver the water in short water years to satisfy the obligation at Lee's Ferry.

The Bureau looks with disfavor on any rehabilitation of the Eden Reservoir. The dam and dikes are in bad shape and water seeps through and under badly. But if this dam and dikes could be rehabilitated, it at one time had a capacity of 16,000 acre-feet, it would help the situation considerably. The supply ditch from the Little Sandy is improved now and is in use. The supply ditch from the Big Sandy would have to be again put into operation.

The Big Sandy Reservoir is designed to carry storage water over from year to year but is not sufficiently large to store enough water to supply the project through a dry cycle of several years.

Lining the canals: It appears there is a very considerable loss in the transportation of water through the canals. The Bureau is remedying this situation. I noticed Congress has made a substantial appropriation for this next year; \$172,000 appropriated for Eden project this last Congress.

About 1 year ago a delegation of the farmers on the project met with the State board of natural resources asking for help. The Governor was at this meeting. As a result the board sent their engineer and their underground water engineer to the project to determine if there was any possibility for relief from underground water sources. A report of this activity will probably soon be released.

Another plan suggested was to buy out the new settlers that may not wish to stay on the project. With the project reduced to the number of acres that the two streams can supply with water, those remaining in the project could be operated with success. This is perhaps the cheapest way out of the difficulty. While it may be said that this has never been heard of before, remedial steps have been made to relieve settlers on irrigation projects where unsurmountable situations have arisen. For instance on the Riverton project where the land has soured and seeped so badly that some of the settlers could no longer make a go of it, Congress made it possible for those people to sell their improvements, relinquish that land and take up new land on another project.

The people who obtained these farm units on this project have had to show that they are practical farmers and that they had either \$5,000, or the equivalent in equipment, to invest in these farms. The situation has become very serious when after they have invested their time and money in these units and are dependent on what they can produce, there hasn't been enough production for them to live on and meet their obligations. This has been going on now

for 3 years. And it's their first 3 years on the project. It would seem that this situation should be remedied and that it should be done quickly.

A few good water years would alleviate this situation for a time but a study of the water records for the last 40 years shows that there have been other water shortages and one back in the thirties was as bad if not worse than this present one. There have been very few years when the water supply amounted to 85,000 acre-feet or enough to give the water users 4 acre-feet per acre at their farm headgates. There have been a number of years when the supply has not been enough to furnish the 68,000 acre-feet, the amount required to give the farmers 3.03 acre-feet at their headgates. One dry year is not so serious provided the previous water year left enough water in storage to tide the project over the next lean year. When there are two or more dry years in succession the situation is bad. This last cycle of dry years has lasted 4 years now and the one back in the thirties lasted for about 10 years but it had 4 years spread through the period when the stream ran enough to furnish 68,000 acre-feet per year for those 4 years.

Information and figures used in this statement have been procured from the definite plan report of the Bureau of Reclamation May 1953, the surface water supply reports of the Geological Survey, the summary statement concerning water use and related matters on the Eden project, Wyoming, as furnished to Senator O'Mahoney February 2, 1960, by Commissioner Floyd Dominy and by personal conversations with farmers on the project and with the engineers of the Bureau of Reclamation.

U.S. DEPARTMENT OF AGRICULTURE,
FARMERS HOME ADMINISTRATION,
Casper, Wyo., October 30, 1961.

Re October 30, 1961, hearing of the Senate Subcommittee, Irrigation and Reclamation, on the problems of settlers on the Farson project.

Hon. J. J. HICKEY,
*U.S. Senator,
Cheyenne, Wyo.*

DEAR SENATOR HICKEY: I am genuinely sorry that road and weather conditions prevented me from appearing before your committee at the subject hearing. Enclosed for your information is the statement I prepared for presentation.

In preparing the attached statement, we limited our remarks strictly to the experiences which we have acquired in our loaning to these settlers. We thought it best not to make controversial statements, and let the subjects of controversy develop from other sources.

There is a vast difference between the Farson units and the units on the Riverton and Heart Mountain project at Powell. At Farson the growing season is so short that cropping systems are limited to alfalfa, small grains, and irrigated pasture. High value crops cannot be raised.

When developing a complete plan of operation for a unit on the Farson project it is essential that the feed producing capacity of the unit be considered, and that a livestock program be developed to utilize the feed. The units are too small for effective beef enterprises so we revert to either farm flocks or dairying. There has been some speculation as to how many breeding ewes one of these places will accommodate. To date we have been unable to find evidence that the better units will support more than 300 ewes. I am sure you realize how far a farming operation based on 300 breeding ewes, or 500 ewes for that matter, will go toward defraying living and farm operating expenses, retiring a \$25,000 or \$30,000 debt on the real estate, and retiring a debt of probably 90 percent of the cost of the machinery and livestock it takes to place the unit in full operation.

We know there is considerable controversy over the water supply. We are not qualified to comment on that subject. We do know there has been a severe water shortage in recent years, whether it is entirely due to weather conditions must be determined by those qualified to make such a determination.

The families who are attracted to this project naturally do not have a large sum of cash to invest in the development of the units; if they were families of substantial means they would surely invest their capital where it would yield a greater rate of return. This then means that families of very moderate means

are settling there, and they must rely on Farmers Home Administration financing for perhaps 75 percent to 90 percent of all capital requirements.

We have not found as yet where the units will support that much debt. There has been some consideration given to enlargement but when enlargement occurs it would have to be moderate, and you still have a high-cost operation with very limited productive capacity. We do not believe that adding another 80 or 120 acres to a given unit is the answer.

Maybe we can visit about this project some day and exchange ideas on the problems of the settlers and measures which could be taken to counteract them. It is certainly a problem that is serious and needs attention.

Very truly yours,

LYNN L. PICKINPAUGH,
State Director.

STATEMENT OF LYNN L. PICKINPAUGH, STATE DIRECTOR, FARMERS HOME
ADMINISTRATION, WYOMING

Mr. Chairman and members of the committee, it is a privilege for me to appear before this committee and present information on the experience of the Farmers Home Administration in extending supervised credit to the settlers of the Farson project.

I should start by explaining that the Farmers Home Administration has 60 loans on the project. Forty of these are farm purchase loans, and for the most part represent the purchase price of the unit less 5 percent cash which was the required minimum downpayment when the units were sold. There are eight farm housing loans which were made for construction of dwellings and other building developments to settlers who had commenced development and had determined to live on and operate their units full time. We have one farm ownership loan which is for essentially the same purpose as the farm housing loans.

There are 11 operating loans, and these are chattel loans made for purchase of livestock, farm equipment, general farm operating expenses, refinancing of chattel indebtedness or any of the other purposes generally needed to operate a farm.

We are attaching to this statement a table entitled "Summary of Active Loans Made on the Farson Project" which gives the number of loans made, amount advanced, loan repayments, delinquencies, and unpaid principal.

The first sales of the Farson project were made in 1957 and the last sale for which the Farmers Home Administration is carrying a loan was made in December 1960, so we do not have an extensive loan history. As early as 1957 some of the settlers applied to our agency for loan assistance to finance building improvements and also applied for loans to purchase machinery, livestock, and other farm operating expenses.

We had benefit of experience from making loans to many homesteaders on the Riverton and Hearth Mountain projects here in Wyoming, as well as a few loans on the Kendrick project at Casper. We anticipated that progress would be slow, and we began our loaning program on the Farson project fully aware that the settlers would be subject to some setbacks and were prepared to service our loans accordingly.

The first year, 1957, was disappointing but we did not expect much progress and we were through the 1958 calendar year before we began to question the productive capacity of the units and to adjust our ideas as to the amount of debt a given unit could support. After a series of conferences at which we studied the problem, reevaluated the units and instructed our appraisers to alter their appraisals in certain respects which resulted in a reduced earning capacity value. We had by then an opportunity to observe the operations on a few of the units and had gradually come to the conclusion that the units could not support a \$25,000 or \$30,000 long-term real estate debt along with the extensive intermediate and short-term financing needed to stock and equip them, and to defray recurring operating and living expenses of the operator. The loan values on the first three units we appraised ranged from \$25,000 to \$30,000 loan value with the planned improvements. Our more recent appraisals have been around \$18,000.

As a means of measuring what is happening to our borrowers on this project we are continuously reviewing cost and income records, checking capital investments, and otherwise observing borrower operations. For purpose of explanation today, we have analyzed the records of six Farmers Home Adminis-

tration borrowers on the project. These six borrowers represent approximately 20 percent of the family units sold and we think should be fairly representative. We have prepared tables showing data on these units, and have attached them to this statement for your information.

I would like to briefly discuss each table with you.

Table I is labeled "A Comparison of Financial Statements—Average for Six Farms." This table shows the average financial statement for the six borrowers: (1) At the time application was made to the selection committee for their units; (2) at the time they applied to the Farmers Home Administration for their initial loan; and (3) as of January 1, 1961. In reviewing this table you will note that the average value of property owned by these six settlers increased from \$17,928 at the time they made application to the selection committee to \$41,300 on January 1, 1961. This is a 131-percent increase. During this same period of time the average of total debts owed increased from \$1,888 to \$33,546 or an increase of 1,633 percent. As a result of this the average net worth of these six operators dropped from \$16,041 at the time they made application for their units through the selection committee to \$7,742 as of January 1, 1961. This amounts to an annual loss in net worth of approximately \$2,500 per year. We believe this is at least some measure of the financial loss being experienced by these six operators. It is also an indication of the financial loss settlers moving onto the project must be prepared to absorb during the first 3 to 5 years of operations. This table does not take into consideration the loan delinquencies of these six settlers on their real estate and chattel loan indebtedness. The delinquencies on all Farmers Home Administration loans averaged about \$4,000 as of January 1, 1961, for the group, and when you consider a combined drop in net worth of \$8,300 in 3 years along with the \$4,000 loan delinquency, it is no small item for a farm family to be faced with.

I would now like to call your attention to table II attached to this statement which is entitled "Use of Loan Funds for Six Project Borrowers." This table shows the amount of money the Farmers Home Administration has loaned to the six settlers under consideration, and the purposes for which the loans were granted. This table breaks the loan advances down into two categories, operating loans and real estate loans.

It is interesting to note that 75 percent of the money loaned for operating purposes has been for the purpose of either purchasing or refinancing secured debts on livestock and machinery. An additional 6 percent was advanced for minor land and building development and must be considered when considering total capital investment in land and buildings. With reference to real estate loans tabulated in this table we would like to point out that 42 percent of the total loan advances was for land acquisition and 58 percent was for building development, fencing, and developing a domestic and livestock water supply.

Through January 1, 1961, the Farmers Home Administration had advanced an average of \$34,127 in all types of loans to these six families. The interest on the \$34,127 amounts to about \$1,200 a year which is equal to approximately \$6 per irrigated acre. We noticed a recent article in our local newspaper to the effect that total dollar income per acre on the project is \$24. That being the case, one-fourth of the total income per acre on these six farms would go for interest alone.

I would now like to call your attention to table III attached to this statement. The title of this table is "Cash Income and Cash Expenses—Average for Six Project Borrowers—Crop Years 1959 and 1960." This table shows the average cash income and cash expense items for the same six families. This table points out one fact which we feel is important and which the committee will no doubt find interesting. These families have been forced to take off-farm employment. The total cash farm income on these units has just barely been sufficient to cover cash outlay for farm operating and family living expenses, and actually it did not cover all of these expenses as reflected by delinquent interest, tax delinquencies, and an accumulation of miscellaneous unsecured debts. The off-farm income provided these families with some funds to apply on their debts, but as will be noted in table IV attached to this statement, they were still short \$685 of meeting the principal loan maturities, and \$1,485 short of meeting loan maturities, depreciation of farm equipment, and normal farm maintenance costs.

There is one other point I would like to call to the attention of the committee with respect to cash expenses shown on table III. The interest item for 1959 was \$675 and it jumped to \$1,023 in 1960. The average for the 2 years is \$849 and this represents not only the largest single item of farm operating expense but 21

percent of the total farm operating expense. We would like to point out also that the notes evidencing the Farmers Home Administration debts call for 3, 4 and 5 percent which as you gentlemen are aware is far below the interest rates prevailing generally for loans for similar purposes.

Table IV attached is labeled "Net Cash Income and Items It Must Cover." This table simply indicates the average net cash income for 1959 and 1960 for the six settlers discussed in this statement. Below that are the minimum items that this net cash income must cover on these units. You will observe as we pointed out earlier, the principal debt maturities exceed the net income by \$685. In addition to that we have shown \$450 as annual cost of maintenance of land, buildings, fences, and \$350 for annual minimum cost of maintenance of livestock inventory, farm and home equipment, and supplies. The net result is a \$1,485 deficiency. In a sound operation the net cash income must cover all of these items and in addition it should provide a reserve to speed up debt retirement, purchase capital replacements, and provide for emergencies.

Table V is labeled "Annual Expenses That Will Increase for Farms on the Project." This is the last table attached to the statement, and in it we have presented some items which we believe the settlers on the Farson project must look forward to in the future. At the present time the operation and maintenance charges are assessed at \$1.35 per acre. We are not positive, but have estimated that these charges could increase to about \$2 per acre, which increase would represent \$135 increased fixed operating cost per year. Construction charges will eventually be levied against these units too, or we assume they will be, and that will probably amount to \$1.10 per acre. This would add \$230 to the fixed operating cost of these units. The project has until now been on a reduced tax schedule. As we understand it, beginning in 1961, property taxes will be increased to the full rate. This would amount to about \$300 more expense per year for each unit. These three items represent \$665 per year increased operating costs which the families will be obliged to meet.

The items in table V are speculative to a degree and could be controversial. We merely mention them to help the committee get the full picture of the problems the settlers on the project are facing.

In summary I would say that the experience of Farmers Home Administration to date in extending supervised credit to the settlers on the project, and our efforts to help these people become soundly established on their units has not been encouraging. We have at this time total loan advances of \$492,228 represented in 60 loans to 40 different families. We believe the families who have gone ahead with developing and operating their units on a full-time scale are in serious financial difficulty. When this occurs the Farmers Home Administration is also in difficulty with its loans to these families.

We have not as yet come to definite conclusions as to what can be accomplished. We realize there has been a shortage of water for irrigation caused by abnormal weather conditions. We know also that this shortage of irrigation water coming as it has during critical first years of development has taken its toll. The thing that we did not properly evaluate in the beginning was the costly timelag between the day when the settler first moves onto his unit until the time when his unit is in full operation. This is becoming more and more prominent in our thinking. Operating losses which must be absorbed during the first 3 to 5 years adds considerably to the total investment in the unit.

The Farmers Home Administration will continue with its borrowers on the project and assist each settler in every possible way as long as we can determine he has a reasonable chance to work out of his difficulties. We will wait and see if an adequate supply of irrigation water materializes, and when that happens we will be obliged to wait and see what progress can be made on these units under the improved conditions.

I again wish to thank the committee for the opportunity to appear here and present the loan experience of the Farmers Home Administration to the settlers on the project. We hope our presentation will add some measure of understanding to the problems involved. We are always open for suggestions and will appreciate constructive criticism and recommendations from any source.

EDEN VALLEY IRRIGATION PROJECT

Summary of active loans made on the Farson project by Farmers Home Administration

Type of loan	Number of loans	Amount advanced	Repayments		Amount delinquent	Unpaid principal balance
			Principal	Interest		
ORE land purchase.....	40	\$295,038	\$25,941	\$14,472	\$4,519	\$269,097
Farm housing.....	8	93,250	1,666	3,812	5,712	91,584
Farm ownership.....	1	13,000	464	2,114	467	12,536
Total real estate.....	49	401,288	28,071	20,398	10,698	373,217
Operating.....	11	90,940	24,573	5,268	21,623	66,367
Total, all loans.....	60	492,228	52,644	25,666	32,321	439,584

TABLE I.—Comparison of financial statements, average for 6 farms

Item	At time of application to SCS for unit	At time of application to FHA for assistance	As of Jan. 1, 1961
ASSETS			
Value of real estate.....	\$4,884	\$14,436	\$25,300
Value of livestock.....	3,459	2,137	5,287
Value of machinery and equipment.....	4,108	3,658	6,682
Value of crops-feed-seed.....	1,291	0	1,810
Value of household goods.....	1,387	1,300	1,092
Cash on hand.....	2,675	3,749	386
Bonds and investments.....	125	83	83
Accounts receivable and others.....	0	342	648
Total property owned.....	17,928	25,705	41,288
DEBTS OWED			
Real estate debts.....	497	9,984	23,000
Chattel debts.....	1,059	248	9,714
Taxes due.....	20	0	197
Other bills.....	312	309	635
Total debts owed.....	1,888	10,541	33,546
Net worth.....	16,041	15,164	7,742
Average loss in net worth per year.....			\$2,500
Average time lapse from application to SCS and 1st application to FHA.....		(1)	
Average time lapse from 1st application to FHA and Jan. 1, 1961.....			(2)

¹ 3½ months.² 36 months.

TABLE II.—Use of loan funds for 6 project borrowers

OPERATING LOANS

Use	Total loaned		Average per borrower
	Amount	Percent	
Purchase livestock.....	\$26,690	38	\$4,448
Purchase machinery.....	13,045	19	2,174
Refinancing.....	12,525	18	2,088
Land development.....	2,970	4	495
Building development.....	1,465	2	244
Operating expenses.....	12,115	17	2,019
Family living expenses.....	1,450	2	242
Total amount advanced.....	70,260	100	\$11,710

REAL ESTATE LOANS

Purchase land.....	\$55,800	42	\$9,300
House.....	60,881	45	10,147
Farm buildings.....	12,770	10	2,128
Water system.....	4,650	3	775
Closing costs.....	399	(²)	67
Total amount advanced.....	134,500	100	\$22,417
Total all loans: All operating and real estate loans.....	204,760	100	\$34,127

¹ Range, \$5,350 to \$15,885.² Less than 1 percent.³ Range, \$17,400 to \$27,900.⁴ Range, \$22,750 to \$43,770.

TABLE III.—Cash income and cash expenses average for 6 project borrowers, crop years 1959 and 1960

Item	Year		2-year average	Percent
	1959	1960		
Off farm income.....	\$1,595	\$2,292	\$1,944	
Cash farm income.....	6,035	7,751	6,893	
Total cash income.....	7,630	10,043	8,837	
Cash family living expenses.....	2,688	3,065	2,876	
Cash farm operating expenses.....	3,661	4,330	3,996	
Total cash expenses.....	6,349	7,395	6,872	
Net cash income.....	1,281	2,648	1,965	
Net cash farm income.....	-314	356	21	
Itemized cash farm expenses:				
Feed.....	188	689	438	11
Seed, fertilizer, pesticide, etc.....	268	31	150	4
Fuel and oil.....	668	646	657	16
Machinery repair and hire.....	222	263	242	6
Hired labor.....	258	110	184	5
Livestock expenses.....	230	182	206	5
Auto and truck expenses.....	284	468	376	9
Building and fence repair.....	140	246	193	5
Property taxes.....	182	103	143	4
Water charges.....	276	272	274	7
Interest.....	675	1,023	849	21
Property insurance.....	120	131	126	3
Others.....	150	166	158	4
Total cash farm operating expenses.....	3,661	4,330	3,996	100

TABLE IV.—*Net cash income and items it must cover*

Average net cash income (1959-60)-----	\$1, 965
Real estate principal debt payment-----	630
Chattel principal debt payment-----	1, 890
Payment on unsecured debts and bills-----	130
Total payments-----	2, 650
Gross cash farm reserve-----	-685
Less:	
Maintenance land, buildings, and fences-----	450
Maintenance inventory, livestock, farm and home equipment, and supplies-----	350
Total-----	800
Net cash reserve for operating expenses, speed up debt repayment, pur- chase additional capital goods and provide reserve for emergencies---	-1, 485

TABLE V.—*Annual expenses that will increase for farms on the project*

	<i>Average per farm</i>
Operation and maintenance charges (from \$1.35 to \$2)-----	\$135
Construction water charges (estimate \$1.10)-----	230
Property taxes-----	300
Total-----	665
Increased cost-----	665
Shortage in meeting debt payments, depreciation, etc.-----	1, 485
Increased income needed just to cover increased costs and deficiency in debt payment, depreciation, etc.-----	2, 150

EDEN, WYO., November 10, 1961.

HON. JOE HICKEY,
*Senator from Wyoming,
 Washington, D.C.*

DEAR SIR: I would like to use this letter to present to you some more information concerning the water shortage situation in Eden Valley. My dad, G.E. Nelson, and I farm 514 irrigable acres here. Dad has lived here since 1922 and I was born here.

	1958	1959	1960	1961
Acres operation and maintenance paid-----	324	324	514	514
Acres irrigated (hay)-----	185	259	319	319
Acres irrigated (grain)-----	149	65	0	0
Acres not irrigated-----	0	¹ 65	195	195
Yield of hay----- tons	460	275	³ 175	350
Yield of hay per acre irrigated ² ----- do	2.5	1.1	0.55	1.1
Yield of grain per acre----- pounds	1, 550	0	0	0
Acres-feet of water used per acre-----	7-9	2.2	1.4	1.5
Acres-feet of water needed per acre-----	⁴ 5-7	5-7	5-7	5-7

¹ Planted 65 acres into grain this year but didn't irrigate it.

² This was figured on the basis of the acres that were irrigated. If it had been figured on the basis of the acres that were all in hay or should have been in hay it would have been considerably lower amount per acre.

³ This is a lower yield per acre than 1959 or 1961 because of the killing frost that we had on June 22.

⁴ This amount is higher than what most farms need. But we are on the dry end of the valley and our farm is as dry as any in the valley. In 1959, 1960, 1961 we ran out of water about July 1 and we didn't irrigate all of the land, as the table shows.

In 1960 if we would have sold our total crop for \$30 per ton we would have made \$10.20 per acre. And in 1961, selling the hay for the same price would have brought us \$20.43 per acre. Then figuring the farming expenses at \$24 per acre, one can see how the lack of water is hurting us.

We run a dairy farm operation and we made up the shortage of hay and grain by buying extra feed.

In case my introduction was too incomplete. I am 34 years old, and I have a B.S. degree in agriculture from the University of Wyoming.

Yours truly,

RICHARD Y. NELSON.



