



A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 15—No. 8

"THERE IS NO SUBSTITUTE FOR WATER"

January, 1969

## District Residents Elect Board Directors



ROSS GOODWIN



JOHN DOUGLAS PITMAN

The recently elected Directors for the High Plains Underground Water Conservation District No. 1 are Mr. John Douglas Pitman and Mr. Ross Goodwin. Neither Mr. Pitman or Mr. Goodwin had an opponent.

Mr. Pitman of Hereford was elected to serve as District Director from District Precinct 4 which includes Potter, Randall, Armstrong and Deaf Smith counties. Mr. Pitman will replace Mr. Andrew Kershen of Hereford who did not rerun for the position on the Board.

Mr. Pitman had distinguished himself as a farmer, businessman and civic leader over the entire state and the Water District is honored to have Mr. Pitman as a member of the Board of Directors.

Mr. Ross Goodwin of Muleshoe was reelected for another two-year term as a member of the board and will be representing Parmer, Castro and Bailey Counties. Mr. Goodwin has been a member of the board since 1965 and is considered to be an expert on water issues.

The official canvassing of the votes by the Board of Directors of the water District had not been completed when *The Cross Section* went to press and the count is not official. The official results will be released soon.

### Texas Water Plan Is Released

The Texas Water Development Board, headed by Howard Boswell, recently released a ten billion dollar plan which will involve a statewide system of lakes, pipelines, and canals to prevent a severe water shortage across the state by the year 2020.

The plan would involve pumping surplus Mississippi River water from below New Orleans across Louisiana to Texas, across the High Plains, and then on westward to El Paso. Included in the plan was another system of canals and pipelines that would carry water across Texas to the lower Rio Grande Valley.

The Board stressed urgency in the project. The Ogallala formation that has made the plains a rich agricultural area is being depleted and more than half of the irrigation acreages will face certain disaster in the future

unless new water supplies are found. It is estimated that the state will have to spend from 2.5 to 3.5 billion dollars on the ten billion dollar plan with the balance coming from the federal government.

The three major arteries of the Texas Water System are the Trans-Texas, Coastal and Eastern Divisions. The Trans-Texas System would bring water to Northwest Texas. From this point various South Plains towns could contract for the water including Abilene, Sweetwater, Snyder, San Angelo and Colorado City.

It is stressed that the High Plains area must "create a master water authority to commit the area's credit to project and to repay the reimbursable costs which will be allocated to irrigation supplies", the Board said.

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### Canadian River Water To Be Used In Recharge Research

In an effort to determine the feasibility of using the Ogallala formation of the High Plains as a storage reservoir for imported water Richmond Brown, director of the U. S. Geological Survey Regional Research Office in Lubbock, recently completed a contract with the city council of Lubbock to purchase 250 gallons of water per minute around the clock for two years.

Raw Canadian River water will be used in the research. It is the first time "clean water" has been available for such experimenting. The natural filtration that takes place through the Ogallala sand has proven that playa lake water cannot be used as a dependable or an economic source of water for long range recharge programs. In most instances recharge wells receiving playa lake

water soon become sealed off cutting the input of recharge water to zero.

If the U.S.G.S. studies prove that the Ogallala aquifer can be recharged and used as a vast storage reservoir for imported water the cost to all water users in the High Plains, "could be reduced by several dollars per acre foot". Natural transmission, a pollution free reservoir, no burden of costly reservoir construction could all be deducted from the cost of an acre foot of water to the user. If impored water could be stored underground during slack seasons it would be mandatory that an agreement would have to be made between the property owners and what every agency would be responsible for recharging the formation for the use of the reservoir. This is only one of the many problems West

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**BOARD OF DIRECTORS**

**Precinct 1**

(LUBBOCK and LYNN COUNTIES)

Russell Bean, President \_\_\_\_\_ 2801 21st St., Lubbock, Texas

**Precinct 2**

(COCHRAN, HOCKLEY and LAMB COUNTIES)

Weldon Newsom, Secretary-Treasurer \_\_\_\_\_ Morton

**Precinct 3**

(BAILEY, CASTRO and PARMER COUNTIES)

Ross Goodwin \_\_\_\_\_ Muleshoe, Texas

**Precinct 4**

(ARMSTRONG, DEAF SMITH POTTER and RANDALL COUNTIES)

John Pitman \_\_\_\_\_ Hereford, Texas

**Precinct 5**

(FLOYD and HALE COUNTIES)

Chester Mitchell, Vice-President \_\_\_\_\_ Lockney, Tex.

**Field Office, Hereford**

Mrs. Mattie K. Robinson \_\_\_\_\_ Secretary

**Field Office, Muleshoe**

Mrs. Darlene Henry \_\_\_\_\_ Secretary

**COUNTY COMMITTEEMEN**

**Armstrong County**

John Patterson, 1971 \_\_\_\_\_ Wayside, Texas  
Foster Parker, 1970 \_\_\_\_\_ Rt. 1, Happy, Texas  
George Denny, 1969 \_\_\_\_\_ Rt. 1, Happy, Texas  
Guy Watson, 1971 \_\_\_\_\_ Wayside, Texas  
James Bible, 1970 \_\_\_\_\_ Wayside, Texas

**Bailey County**

Mrs. Darlene Henry  
High Plains Water District  
Box 563, Muleshoe Texas  
Lloyd Throckmorton, 1971 \_\_\_\_\_ Box 115, Muleshoe  
Ernest Ramm, 1970 \_\_\_\_\_ Rt. 2, Muleshoe  
W. L. Welch, 1970 \_\_\_\_\_ Star Rt., Maple  
J. W. Witherspoon, 1969 \_\_\_\_\_ Box 261, Muleshoe  
R. L. Davis, 1971 \_\_\_\_\_ Box 61 Maple  
Committee meets last Friday of each month at 2:30 p. m., 217 Avenue B, Muleshoe, Texas.

**Castro County**

E. B. Noble  
City Hall Dimmitt, Texas  
Calvin Petty, 1969 \_\_\_\_\_ Box 605, Dimmitt, Texas  
Dale Maxwell, 1970 \_\_\_\_\_ Hiway 385, Dimmitt, Tex.  
Frank Wise, 1970 \_\_\_\_\_ 716 W. Grant, Dimmitt, Tex.  
Donald Wright 1971 \_\_\_\_\_ Box 65, Dimmitt Texas  
Morgan Dennis, 1971 \_\_\_\_\_ Star Rt. Hereford, Tex.  
Committee meets on the last Saturday of each month at 10:00 a. m., City Hall, Dimmitt, Texas.

**Cochran County**

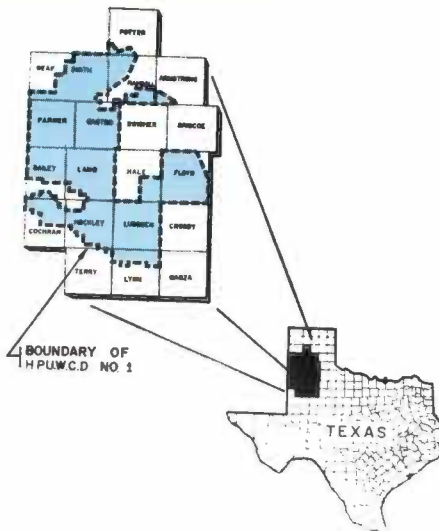
W. M. Butler Jr.  
Western Abstract Co., Morton, Texas  
Ronald Coleman, 1971 \_\_\_\_\_ Rt. 1, Morton, Texas  
D. A. Ramsey, 1970 \_\_\_\_\_ Star Rt. 2, Morton, Texas  
Willard Henry, 1969 \_\_\_\_\_ Rt. 1, Morton, Texas  
Hugh Hansen 1970 \_\_\_\_\_ Rt. 2, Morton, Texas  
Don Keith, 1971 \_\_\_\_\_ Rt. 1, Morton, Texas  
Committee meets on the second Wednesday of each month at 8:00 p. m., Western Abstract Co., Morton, Texas.

**Deaf Smith County**

Mattie K. Robinson  
317 N. Sampson, Hereford, Texas  
W. H. Gentry, 1969 \_\_\_\_\_ 400 Sunset, Hereford  
Billy Wayne Sisson, 1971 \_\_\_\_\_ Rt. 5 Hereford  
Frank Zinser, 1970 \_\_\_\_\_ Rt. 5, Hereford  
L. B. Wortham, 1970 \_\_\_\_\_ Rt. 3, Hereford  
Harry Fuqua, 1971 \_\_\_\_\_ Rt. 1, Hereford  
Committee meets the first Monday of each month at 7:30 p. m., High Plains Water District office, Hereford, Texas.

**Floyd County**

Sue McCord, County Secretary  
101 South Wall Street, Floydada, Texas  
Pat Frizzell 1970 \_\_\_\_\_ Box 1046, Lockney  
J. S. Hale, Jr., 1969 \_\_\_\_\_ Rt. 1, Floydada  
Tate Jones, 1970 \_\_\_\_\_ Rt. 4 Floydada  
M. M. Julian, 1971 \_\_\_\_\_ Box 65, South Plains  
M. J. McNeill, 1971 \_\_\_\_\_ 833 W. Tenn., Floydada  
Committee meets on the first Tuesday of each month at 10:00 a. m., Farm Bureau Office, Floydada Texas.



**Hale County**  
J. B. Mayo  
1617 Main, Petersburg, Texas  
Charles Schuler, 1970 \_\_\_\_\_ Petersburg  
Don Hegi, 1970 \_\_\_\_\_ Box 160 A, Petersburg  
W. D. (Dub) Scarborough 1969 \_\_\_\_\_ Box 174, Petersburg  
Harold D. Rhodes, 1971 \_\_\_\_\_ Box 100, Petersburg  
J. C. Aldford, 1971 \_\_\_\_\_ Box 28, Petersburg  
Committee meets first Monday each month at Water District office in Petersburg.

**Hockley County**  
Murray C. Stewart  
208 College Levelland, Texas  
Ewel Exum, 1971 \_\_\_\_\_ Rt. 1, Ropesville  
J. E. Wade, 1970 \_\_\_\_\_ Rt. 2, Littlefield  
Jimmy Price, 1970 \_\_\_\_\_ Rt. 3, Levelland  
H. R. Phillips, 1971 \_\_\_\_\_ Rt. 4, Levelland  
S. H. Schoenrock, 1969 \_\_\_\_\_ Rt. 2, Levelland  
Committee meets first and third Fridays of each month at 1:30 p. m., 917 Austin St. Levelland, Texas.

**Lamb County**  
Calvin Price  
620 Hall Avenue, Littlefield, Texas  
Gene Templeton, 1971 \_\_\_\_\_ Star Rt. 1, Earth  
Jack Thomas, 1970 \_\_\_\_\_ Box 13, Olton  
W. B. Jones, 1969 \_\_\_\_\_ Rt. 1, Antou  
Lee Roy Fisher, 1970 \_\_\_\_\_ Box 344, Sudan  
Artis Barton, 1971 \_\_\_\_\_ Hiway 70, Earth  
Committee meets the first Thursday of each month at 8:00 p. m., Crescent House Restaurant, Littlefield.

**Lubbock County**  
Mrs. Doris Hagens  
1628 15th Street, Lubbock Texas  
Glenn Blackmon, 1971 \_\_\_\_\_ Rt. 1, Shallowater  
R. F. (Bob) Cook, 1970 \_\_\_\_\_ 804 6th St., Idalou  
Bill Dorman, 1970 \_\_\_\_\_ 1910 Ave. E, Lubbock  
Edward Moseley, 1969 \_\_\_\_\_ Rt. 2, Slaton  
Andrew (Buddy) Turnbow, 1971 \_\_\_\_\_ Rt. 5, Lubbock  
Committee meets on the first and third Mondays of each month at 1:30 p. m., 1628 15th St. Lubbock, Texas.

**Lynn County**  
Mrs. Doris Hagens  
1628 15th Street, Lubbock, Texas  
Don Smith, 1969 \_\_\_\_\_ Box 236, New Home  
Roy Lynn Kahlich, 1970 \_\_\_\_\_ Wilson  
Roger Blakney, 1970 \_\_\_\_\_ Rt. 1, Wilson  
Reuben Sander, 1971 \_\_\_\_\_ Rt. 1, Slaton  
O. R. Pifer, Jr., 1971 \_\_\_\_\_ New Home  
Committee meets the third Tuesday of each month at 10:00 a. m., 1628 15th Street, Lubbock, Texas.

**Parmer County**  
Aubrey Brock  
Wilson & Brock Insurance Co., Bovina, Texas  
Guy Latta, 1971 \_\_\_\_\_ Friona  
Webb Gober, 1969 \_\_\_\_\_ RFD Farwell  
Henry Ivy, 1970 \_\_\_\_\_ Rt. 1, Friona  
Jim Ray Daniel, 1970 \_\_\_\_\_ Friona  
Edwin Lide, 1971 \_\_\_\_\_ Rt. D, Bovina  
Committee meets on the first Thursday of each month at 8:00 p. m., Wilson & Brock Insurance Agency, Bovina, Texas.

**Potter County**  
Fritz Meneke, 1970 \_\_\_\_\_ Rt. 1, Box 538 Amarillo  
W. J. Hill, Jr., 1969 \_\_\_\_\_ Bushland  
Jim Line, 1971 \_\_\_\_\_ Bushland  
Vic Plunk, 1970 \_\_\_\_\_ Rt. 1, Amarillo  
Temple Rodgers, 1971 \_\_\_\_\_ Rt. 1, Amarillo

**Randall County**  
Mrs. Louise Knox  
Randall County Farm Bureau Office, Canyon  
R. B. Gist, Jr. 1971 \_\_\_\_\_ Rt. 3, Box 43 Canyon  
Ralph Ruthart, 1969 \_\_\_\_\_ Rt. 1, Canyon  
Carl Hartman, Jr. 1971 \_\_\_\_\_ Rt. 1, Canyon  
Marshall Rockwell, 1970 \_\_\_\_\_ Canyon  
Richard Friemel, 1970 \_\_\_\_\_ Rt. 1, Canyon  
Committee meets on the first Monday of each month at 8:00 p. m. 1710 5th Ave., Canyon, Tex.

# SUN OIL vs. WHITAKER

During the week of January 6, the case of Sun Oil Company vs. Earnest Whitaker was tried before a jury in the District Court of Cochran County, Texas, resulting in a verdict favorable to the landowner, Mr. Earnest Whitaker, although the jurors were unable to agree on the answer to one question submitted to them.

Sun's use of his water for secondary recovery purposes.

After an unsuccessful attempt to obtain a jury in Hockley County, Texas, it was determined that the case should be moved to Cochran County, Texas, and there in Morton, Texas, on January 6, the case went to trial. It was tried before a jury this time and the jury returned its verdict on Friday, January 10.

Readers of the *Cross-Section* will remember that in 1966 the case of Sun Oil Company vs. Whitaker was tried in the District Court in Hockley County, Texas. In that trial, Sun Oil Company sought to enjoin Mr. Earnest Whitaker from interfering with Sun's production and use of Ogallala water for waterflood purposes in connection with the production of oil and gas. In that case, the High Plains Underground Water Conservation District No. 1 was an Intervenor. Judge M. C. Ledbetter, the Trial Judge before whom that temporary injunction hearing was tried, denied Sun's Application for a Temporary Injunction. The case was appealed and after going through the Amarillo Court of Civil Appeals and the Supreme Court of Texas, Judge Ledbetter's ruling was left unchanged.

Twelve questions were submitted to the jury. The jury was unable to reach agreement on the first question which asked whether the use of water by Sun Oil Company for secondary recovery purposes resulted in the taking of water from the existing wells of Whitaker.

The remaining questions were answered as follows:

(a) The parties to the lease involved in the lawsuit did not mutually intend for Sun Oil Company to use such quantities of water as would materially affect the supply Mr. Whitaker could produce by wells.

(b) The use of fresh water by Sun Oil Company for secondary recovery purposes from the well which it has drilled on Mr. Whitaker's land will materially effect the supply which Mr. Whitaker could produce by wells.

As indicated above, the 1966 trial was with respect to a temporary injunction. Sun Oil Company also sought a permanent injunction and after the appeal through the Supreme Court was completed, Sun Oil Company amended its pleadings so as to seek an injunction against Mr. Whitaker from interfering with an existing water supply well which was equipped to produce less than 100,000 gallons per day. The permanent injunction sought by Sun Oil Company was to prevent and prohibit Mr. Whitaker from interfering with the water supply well only so long as it was equipped to produce an amount of less than 100,000 gallons per day. Such a well is below or outside of the jurisdiction of the High Plains Water District. The High Plains Water District withdrew as a party to the suit and the case proceeded with Sun Oil Company as Plaintiff and Earnest Whitaker as Defendant. Mr. Whitaker also filed a Cross-Action seeking damages from Sun Oil Company for

(c) It is not reasonably necessary for Sun Oil Company to use water from the Ogallala Formation underlying Mr. Whitaker's farm to waterflood the Oil and Gas Lease being operated by Sun Oil Company on Mr. Whitaker's farm.

(d) A custom existed in Hockley County, Texas, at the time Sun Oil Company's Oil and Gas Lease was executed for oil companies to use fresh water only in substantially smaller amounts than those needed for waterflood purposes.

(e) Both parties to the Sun Oil Company Oil and Gas Lease knew of such custom prior to the time the lease was signed.

(f) The proposed use of fresh water by Sun Oil Company for waterflood purposes will substantially devalue the farm owned by Mr. Whitaker.

(g) The installation of the waterflood facilities on the land of Mr. Whitaker by Sun Oil Company des-

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**DRILLING STATISTICS FOR OCT., NOV., DEC., 1968**

County	Permits Issued	New Wells Completed	Replacement Wells Drilled	Dry Holes
Armstrong	0	0	0	0
Bailey	6	0	2	0
Castro	21	19	0	0
Cochran	2	0	0	0
Deaf Smith	40	35	3	0
Floyd	12	11	1	0
Hale	3	2	0	0
Hockley	3	6	0	2
Lamb	7	6	0	0
Lubbock	20	10	0	0
Lynn	5	3	0	1
Parmer	29	27	1	0
Potter	3	0	0	0
Randall	4	6	1	0
<b>TOTALS</b>	<b>155</b>	<b>125</b>	<b>8</b>	<b>3</b>



# WATER COMMITTEE MAKES RECOMMENDATIONS

The House Interim Water Study Committee, chaired by Representative Bill Clayton, after holding hearings regarding water resource development and related State water problems in various parts of the State, is

## Water Plan . . .

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Both Governor Preston Smith and Lt. Governor Ben Barnes acknowledged the immediacy of the project but said the path may be rough. They agree that cooperation will be needed from all levels of Government if the plan is to be a success and a reality in the future.

It is understood the 1969 legislature will be asked to approve the State's part in financing the project. The legislature also will be asked for approval of a constitutional amendment lifting the present four hundred million dollar ceiling on a state water plan.

The Water Plan is the largest project of its kind ever attempted and is said to be a necessity if we are to feed the hungry people of the world in the next half century.

★ ★ ★

prepared to present to the Legislature several bills and proposals. The following are some of the recommendations that will be made:

1. That a constitutional amendment allowing three and one-half billion dollars of revenue bonds for use in water development by the Water Development Board be proposed. Under the provisions of the amendment, these bonds can not be issued except when they have been approved by a 2/3's vote of the legislature in stipulated amounts.
2. That the power of eminent domain be given to the Water Development Board in order to allow the purchase of lands for reservoirs.
3. That the Water Development Board be allowed to lease land acquired for reservoir sites to individuals and corporations; and that a method of payment to the local government entity be provided in such an amount that it will equal their present ad valorem taxes.
4. That certain types of inactive water districts be dissolved.
5. That the State, through the Water Rights Commission have control of ground water to the same extent that underground

water conservation districts presently have, but only in those areas where there are no districts.

6. That there should be closer coordination of personnel, data collecting and assimilation, and equipment for the various water agencies; and that a new State Office Building be constructed to house all State water agencies.
7. That various types of Districts and River Authority be given the authority to issue revenue bonds to build parks.
8. That a Master Water Authority be created with powers to contract with the United States Government, State of Texas, and other persons; and the power to levy a tax and issue bonds. Such authority territory to be designated by the people in a given import area.
9. That the Texas Water Quality Board be designated as arbitrator when needed in settling disputes over the cost of treating sewage.

Representative Clayton and the Committee fully endorse and support the economic in-put, out-put study being conducted by Doctor Herb

Grub of the Planning Division of the Governor's Office. The Committee also urges full support and speedy implementation of the Texas Water Plan as presented by the Texas Water Development Board.

Clayton stated that he felt the Committee's work has been very fruitful, and that most of the recommendations presented by the Committee will prove acceptable to the Legislature.

Representative Clayton also stated that he believes the incoming administration will give top priority to water resource development and implementation of the Texas water plan.

## WEST TEXAS WATER CONFERENCE

The seventh annual West Texas Water Conference will be held in Lubbock, Texas, Friday, February 7th, beginning at 8 a.m. in the Student Union Building on the Texas Tech Campus.

The conference, which is sponsored by the West Texas Water Institute and 30 cooperating agencies, will feature an array of distinguished speakers.

The speakers will include:

*Harvey Banks*—president, Leeds, Hill & Jewett, consulting engineers of San Francisco. The Conference keynote speaker will address luncheon guests on water issues facing West Texas.

*Bill Clayton*—Texas state representative from Springlake who will open the meeting with a discussion of legislation which affects water resources.

*Howard Boswell*—executive director of the Texas Water Development Board. His address will concern the Texas Water Plan and recent revisions made in it.

*David H. Brune*—representing the Trinity River Authority, Arlington, will outline citizen action in water problems, or what the individual can contribute to better management of water resources.

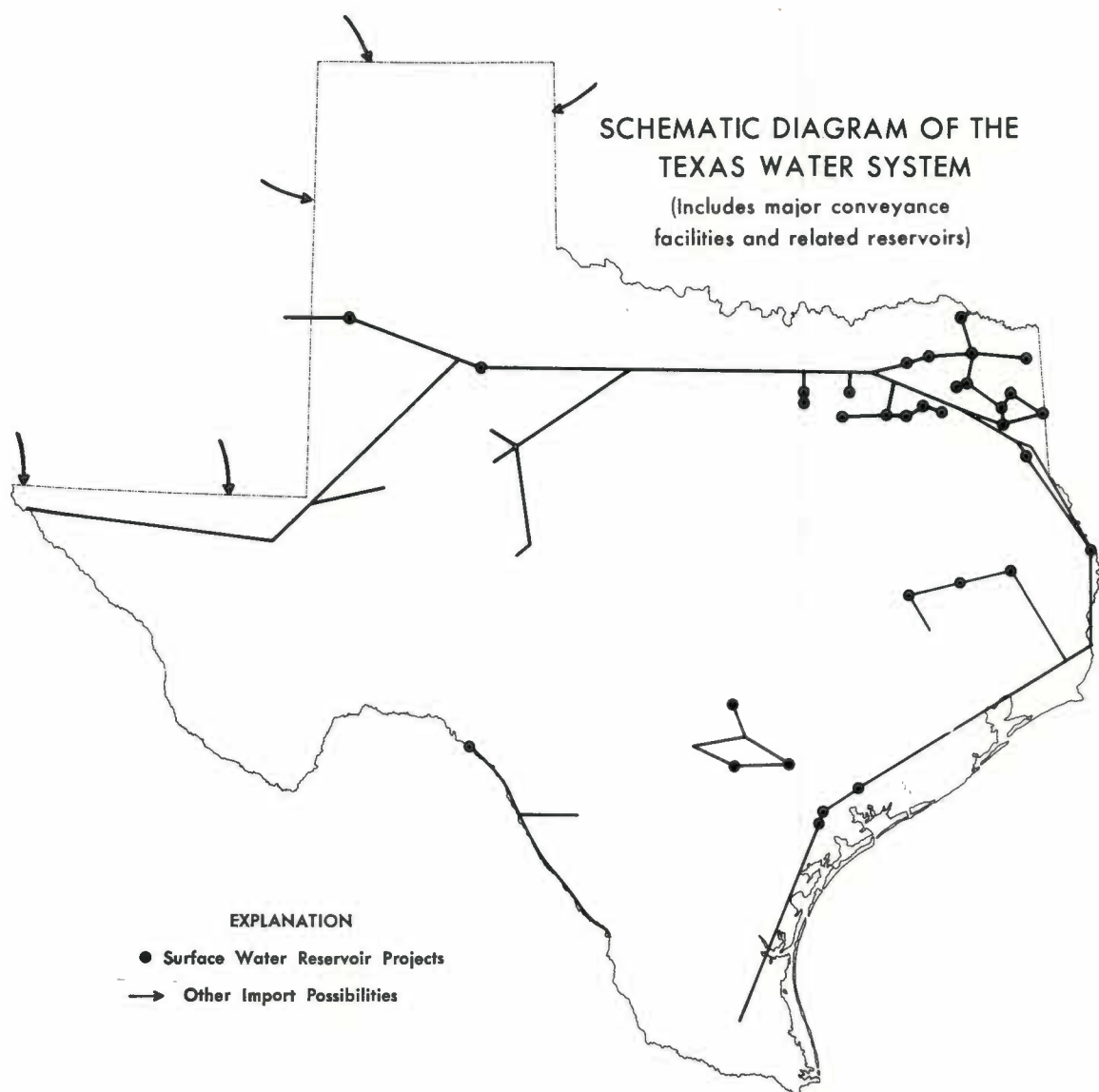
*Herbert Grubb*—professor of agricultural economics, Texas Tech, and representing the Division of Planning Coordination, State of Texas, Austin. Dr. Grubb will outline water pricing policies.

*George Whetstone*—acting chairman, Texas Tech Department of Civil Engineering. Water from the Mississippi, water from Missouri, water from Canada? Dr. Whetstone's topics will be changing attitudes in interbasin diversions.

*Willie L. Ulich*—chairman, Texas Tech Department of Agricultural Engineering, who will report on irrigation efficiency studies conducted in his department with the cooperation of rural electrification agencies.

**AND OTHER SPEAKERS**—including Texas Tech President Grover E. Murray and Texas Tech Dean of Agricultural Sciences Gerald W. Thomas.

Make plans now to attend this important conference on Friday, February the 7th.





# Mississippi River Water Plan For Plains, N. Mexico Proposed

The continued article from the November issue of THE CROSS SECTION.

By GEORGE A. WHETSTONE

There exists, however, strong support in Canada for a wholly Canadian-based entity which would develop surplus Canadian water for sale at the border. It is important to notice that the commodity involved is *water*, not *water rights*. Advocates of this operation point out that Canada has water which will be surplus for the foreseeable future, and that sale of water differs little in character from sale of electricity, fish, timber, furs, or crops. On the contrary, sale of these renewable resources is far easier to justify than is the sale of mineral products — metals, coal, or petroleum—all of which are being exported without qualms at present.

As Professor Kuiper of the University of Manitoba emphasized in a recent study (6), there exists a foreseeable surplus of some 200 million acre-feet per year in Northwest Ontario easily divertable to the Great Lakes, and thence, to the Mississippi. Another 100 million acre-feet per year of water from the Canadian prairie provinces could supply a system of canals such as visualized in Tinney's CeNAWP plan. Before Canadian water can be made available, however, Canada must determine ownership of the water as between province and Dominion. As you know only too well from experience on the Rio Grande and Colorado, interstate and state-federal compacts are reached slowly.

The existence of such water, however, would seem to indicate the viability of a two-phase program for watering New Mexico and West Texas:

(1) Construct one or more of the aqueducts from the Mississippi River using the existence and potential purchasability of Canadian water as insurance to the riparian users in the Mississippi Valley that they will suffer no deprivation.

(2) Construct the prairie canals of CeNAWP permitting the substitution

of purchased Canadian water for that now obtained by trans-divide diversions from the Colorado River Basin in New Mexico and Colorado.

Supply to the Pecos Valley calls merely for handling larger quantities in the aqueducts under study for supplying the High Plains.

The first phase of Rio Grande supply could well take the form of a substitution downstream from the mouth of the Pecos of water added to the Pecos to replace the natural flow from the mainstream of the Rio Grande. Later, direct supply of the Rio Grande could be incorporated in a project largely underwritten by Arizona and California to divert Mississippi River and/or Canadian water into the Gila River.

#### REFERENCES

- (1) TINNEY, E. ROY, "Engineering Aspects" in a symposium: "Nawapa: A Continental Water System." *Bulletin of the Atomic Scientists*. September 1967, pp. 8-27.
- (2) U.S. BUREAU OF RECLAMATION, Region 5. "Progress Report on West Texas and Eastern New Mexico Import Project Investigations." Amarillo, Texas. May 1968, 92 pp.
- (3) ANON, "Colorado River Bill Clears House." *Engineering News-Record*. 12 September, 1968, p. 13.
- (4) McNAUGHTON, Gen. A. G. L. "A Monstrous Concept, A Diabolic Thesis," in a symposium: "Water Resources of Canada." Royal Society of Canada, 1967, pp. 16-24.
- (5) KUIPER, Edward. "Feasibility of Water Export." *Proceedings of the American Society for Civil Engineers*. Vol. 94, HY4. July 1968, pp. 873-891.

**Water Is Your  
Future,  
Conserve It!**

## Sun vs. Whitaker . . .

—continued from page 2

troyed some of Mr. Whitaker's growing crops.

(h) The reasonable cash market value of Mr. Whitaker's crops which were destroyed was \$331.00.

(i) The reasonable cash market value of the fresh water that Sun Oil Company has produced from Mr. Whitaker's farm for waterflood purposes from the beginning of the waterflood to the date of the trial is \$9,667.03.

(j) Sun Oil Company acted willfully and maliciously in producing fresh water from the Whitaker farm and using it for waterflood purposes.

(k) Mr. Whitaker is entitled to the sum of \$2,500.00 as exemplary damages.

At the date of this writing, a Judgment has not been entered by the Court. It is expected that both Sun Oil Company and Mr. Whitaker will ask the Court to enter a Judgment in their favor and that a hearing will be held on the Motions of these parties.

## Canadian River Water

—continued from page 1

Texas citizens must face up to at some point in time if we are fortunate enough to receive a never ending supply of good water. One Parmer County farmer answered the question of storage this way, "I'll give 'em everything from the base of the gear head to the red-bed if I can begin takin' off ten foot of suction pipe ever now and then instead of addin' it all the time".

**PLEASE  
CLOSE  
THOSE  
ABANDONED  
WELLS**



Now is the time to construct your tailwater return system.



# THE Cross SECTION

A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 15—No. 9

"THERE IS NO SUBSTITUTE FOR WATER"

February, 1969



The Board of Directors of the High Plains Underground Water Conservation District for 1969 are shown above. Seated, left to right, is Mr. Chester Mitchell, Vice President, Lockney; Mr. Russell Bean, President, Lubbock; Mr. Weldon Newsom, Secretary-Treasurer, Morton. Standing, left to right, Mr. Ross Goodwin, Muleshoe and Mr. John Douglas Pitman, Hereford.

## WATER DISTRICT ELECTION RESULTS

The results of the Water District election were made official after being canvassed by the Board at the last Board meeting.

Mr. Ross Goodwin and Mr. John Douglas Pitman were elected as District Directors.

In each of the thirteen Water District counties, one committeeman was elected to serve for three-year terms of office on a five-man county committee. The County Committeemen approve well-drilling applications and attend to the general Water District business in their particular County. The Committeemen also serve as advisory groups to the Board of Directors, expressing the desires of the people in their Counties. The terms of office of the Committeemen are staggered so there is one elected the first year, two the next, and two are elected the third year.

The residents of Crosby County that lived within the area that was to be annexed, voted to become a part of the Water District but did not vote to pay the tax. They wanted to receive the benefits of being in the Water District but they did not want to pay their share of the expense. Because of the failure to pass the tax portion of the election, Crosby County is not a part of the Water District.

All Commissioner's Court Precincts

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## DISTRICT DIRECTORS RECEIVE OATH

John Douglas Pitman of Hereford, and Ross Goodwin of Muleshoe, received the oath of office administered to members of the Board of Directors of the High Plains Water District, from Judge Howard Davison, during luncheon ceremonies in Lubbock on February 21st.

Mr. Pitman was elected by the residents of District Precinct No. 4 which includes Potter, Randall, Armstrong and Deaf Smith Counties. Mr. Goodwin was re-elected from District Precinct No. 3 to continue serving on the Board as the representative from Parmer, Castro and Bailey Counties.

Mr. Pitman and Goodwin will each

—continued from page 3

## Water District Bill Introduced

Representative Bill Clayton of Springlake has recently introduced House Bill No. 39 into the Texas Legislature for the High Plains Water District.

House Bill No. 39 reads as follows:

A BILL TO BE ENTITLED  
AN ACT

authorizing the Board of Directors of the High Plains Underground Water Conservation District No. 1 to adopt resolutions providing certain compensation to be paid tax assessors and collectors for assessing and collecting taxes; and declaring an emergency.

BE IT ENACTED BY THE  
LEGISLATURE OF THE  
STATE OF TEXAS:

Section 1. The Board of Directors of the High Plains Underground Water Conservation District No. 1 may by resolution provide that any assessor and collector who collects taxes for the district shall receive two percent of the total taxes shown on the completed roll for assessing the taxes and two percent for collecting the taxes. The assessor-collector's compensation for collecting delinquent taxes shall be five percent of the amount of delinquent taxes collected.

Section 2. The importance of this legislation and the crowded condition of the calendars in both houses create

—continued on page 3

## DEPLETION MAPS RELEASED

The High Plains Underground Water Conservation District No. 1 has released contour maps showing the decline of the water table in the Ogallala formation during 1968.

Maps have been prepared for each of the 15 counties in the Water District. The maps have been reviewed and accepted by Internal Revenue Service Engineers, and are to be used as guidelines in calculating cost-in-water-depletion and income-tax allowances.

These maps are available at the District Office, at 1628, 15th Street, Lubbock, Texas 79401. A charge of \$0.50 per map is made to defray handling costs.





A MONTHLY PUBLICATION OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1

1628 15th Street, Lubbock, Texas 79401  
Telephone PO 2-0181

JIMMY ROSS, Editor

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**District Office Lubbock**

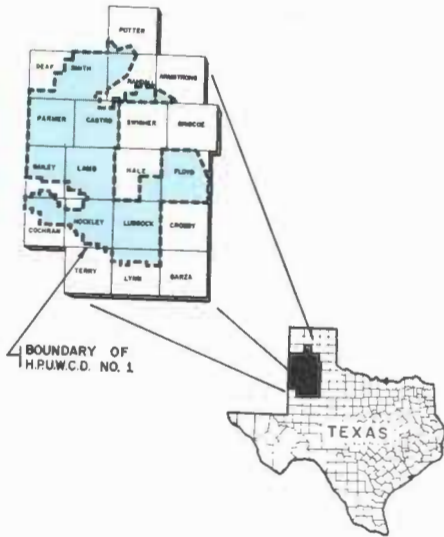
- Tom McFarland ..... District Manager
- Jimmy Ross ..... Cross Section—Public Relations
- Frank Rayner ..... Chief Engineer
- Albert W. Sechrist ..... Agricultural Engineer
- Tony Schertz ..... Draftsman
- Kenneth Seales ..... Field Representative
- Herb Spradlin ..... Field Representative
- Obbie Goolsby ..... Field Representative
- J. Dan Seale ..... Field Representative
- Ernestine Cox ..... Bookkeeper
- Doris Hagens ..... District Secretary
- Clifford Thompson ..... Secretary
- Jo Ann Bilbrey ..... Secretary

**BOARD OF DIRECTORS**

- Precinct 1**  
(LUBBOCK and LYNN COUNTIES)  
Russell Bean, President ..... 2301 21st St., Lubbock
- Precinct 2**  
(COCHRAN, HOCKLEY and LAMB COUNTIES)  
Weldon Newsom, Secretary-Treasurer ..... Morton
- Precinct 3**  
(BAILEY, CASTRO and FARMER COUNTIES)  
Ross Goodwin ..... Muleshoe
- Precinct 4**  
(ARMSTRONG, DEAF SMITH, POTTER and RANDALL COUNTIES)  
John Pitman ..... Hereford
- Precinct 5**  
(FLOYD and HALE COUNTIES)  
Chester Mitchell, Vice-President ..... Lockney

**COUNTY COMITTEEMEN**

- Armstrong County**  
John Patterson, 1971 ..... Wayside  
Foster Parker, 1970 ..... Rt. 1, Happy  
Guy Watson, 1971 ..... Wayside  
James Bible, 1970 ..... Wayside  
Carroll Rogers, 1972 ..... Wayside
- Bailey County**  
Darlene Henry  
High Plains Water District  
Box 563, Muleshoe  
Lloyd Throckmorton, 1971 ..... Box 115, Muleshoe  
Ernest Ramm, 1970 ..... Rt. 2, Muleshoe  
W. L. Welch, 1970 ..... Star Rt., Maple  
R. L. Davis, 1971 ..... Box 61, Maple  
Jessie Ray Carter, 1972 ..... Rt. 5, Muleshoe  
Committee meets last Friday of each month at 2:30 p.m., 217 Avenue B, Muleshoe, Texas.
- Castro County**  
E. B. Noble  
City Hall, Dimmitt, Texas  
Dale Maxwell, 1970 ..... Hiway 385, Dimmitt  
Frank Wise, 1970 ..... 716 W. Grant, Dimmitt  
Donald Wright, 1971 ..... Box 65, Dimmitt  
Morgan Dennis, 1971 ..... Star Rt., Hereford  
John Gilbreath, 1972 ..... Rt. 2, Hart  
Committee meets on the last Saturday of each month at 10:00 a.m., City Hall, Dimmitt, Texas.
- Cochran County**  
W. M. Butler Jr.  
Western Abstract Co., Morton, Texas  
Ronald Coleman, 1971 ..... Rt. 1, Morton  
D. A. Ramsey, 1970 ..... Star Rt. 2, Morton  
Hugh Hansen, 1970 ..... Rt. 2, Morton  
Don Keith, 1971 ..... Rt. 1, Morton  
Keith Kennedy, 1972 ..... Star Rt. 2, Morton  
Committee meets on the second Wednesday of each month at 8:00 p.m., Western Abstract Co., Morton, Texas.
- Deaf Smith County**  
B. F. Cain, 2nd Floor  
County Court House, Hereford, Texas  
Billy Wayne Sisson, 1971 ..... Rt. 5, Hereford  
Frank Zinser, 1970 ..... Rt. 5, Hereford  
L. B. Wortham, 1970 ..... Rt. 3, Hereford  
Harry Fuqua, 1971 ..... Rt. 1, Hereford  
W. L. Davis, Jr., 1972 ..... Hereford  
Committee meets the first Monday of each month at 7:30 p.m., High Plains Water District office, Hereford, Texas.
- Floyd County**  
Gayle Baucum  
101 South Wall Street, Floydada, Texas  
Pat Frizzell, 1970 ..... Box 1046, Lockney  
Tate Jones, 1970 ..... Rt. 4, Floydada  
M. M. Julian, 1971 ..... Box 65, South Plains  
M. J. McNeill, 1971 ..... 833 W. Tenn., Floydada  
Melvin Jarboe, 1972 ..... Rt. 4, Floydada  
Committee meets on the first Tuesday of each month at 10:00 a.m., Farm Bureau Office, Floydada, Texas.



- Hale County**  
J. B. Mayo  
1617 Main, Petersburg, Texas  
Charles Schuler, 1970 ..... Petersburg  
Don Hegi, 1970 ..... Box 160 A, Petersburg  
Harold D. Rhodes, 1971 ..... Box 100, Petersburg  
J. C. Alford, 1971 ..... Box 28, Petersburg  
W. D. Scarborough, Jr., 1972 ..... Petersburg  
Committee meets first Monday each month at Water District office in Petersburg.
- Hockley County**  
Murray C. Stewart  
208 College, Levelland, Texas  
Ewel Exum, 1971 ..... Rt. 1, Ropesville  
J. E. Wade, 1970 ..... Rt. 2, Littlefield  
Jimmy Price, 1970 ..... Rt. 3, Levelland  
H. R. Phillips, 1971 ..... Rt. 4, Levelland  
Bryan Daniel, 1972 ..... N. Sherman, Levelland  
Committee meets first and third Fridays of each month at 1:30 p.m., 917 Austin St., Levelland, Texas.
- Lamb County**  
Calvin Price  
620 Hall Avenue, Littlefield, Texas  
Gene Templeton, 1971 ..... Star Rt. 1, Earth  
Jack Thomas, 1970 ..... Box 13, Olton  
Lee Roy Fisher, 1970 ..... Box 344, Sudan  
Artis Barton, 1971 ..... Hiway 70, Earth  
W. W. Thompson, 1972 ..... Spade  
Committee meets the first Thursday of each month at 8:00 p.m., Crescent House Restaurant, Littlefield.
- Lubbock County**  
Doris Hagens  
1628 15th Street, Lubbock, Texas  
Glenn Blackmon, 1971 ..... Rt. 1, Shallowater  
R. F. (Bob) Cook, 1970 ..... 804 6th St., Idalou  
Bill Dorman, 1970 ..... 1910 Ave. E, Lubbock  
Andrew (Buddy) Turnbow, 1971 ..... Rt. 5, Lubbock  
Alex Bednarz, 1972 ..... Rt. 1, Slaton  
Committee meets on the first and third Mondays of each month at 1:30 p.m., 1628 15th St., Lubbock, Texas.
- Lynn County**  
Doris Hagens  
1628 15th Street, Lubbock, Texas  
Roy Lynn Kahlich, 1970 ..... Wilson  
Roger Blakney, 1970 ..... Rt. 1, Wilson  
Reuben Sander, 1971 ..... Rt. 1, Slaton  
O. R. Phifer, Jr., 1971 ..... New Home  
Dale Zant, 1972 ..... Rt. 1, Wilson  
Committee meets the third Tuesday of each month at 10:00 a.m., 1628 15th Street, Lubbock, Texas.
- Farmer County**  
Aubrey Brock  
Wilson & Brock Insurance Co., Bovina, Texas  
Guy Latta, 1971 ..... Friona  
Henry Ivy, 1970 ..... Rt. 1, Friona  
Jim Ray Daniel, 1970 ..... Friona  
Edwin Lide, 1971 ..... Rt. D, Bovina  
Webb Gober, 1972 ..... RFD, Farwell  
Committee meets on the first Thursday of each month at 8:00 p.m., Wilson & Brock Insurance Agency, Bovina, Texas.
- Potter County**  
Fritz Meneke, 1970 ..... Rt. 1, Box 538, Amarillo  
Jim Line, 1971 ..... Bushland  
Vic Plunk, 1970 ..... Rt. 1, Amarillo  
Temple Rodgers, 1971 ..... Rt. 1, Amarillo  
F. G. Collard, 1972 ..... Rt. 1, Amarillo
- Randall County**  
Louise Knox  
Randall County Farm Bureau Office, Canyon  
R. B. Gist, Jr., 1971 ..... Rt. 3, Box 43, Canyon  
Carl Hartman, Jr., 1971 ..... Rt. 1, Canyon  
Marshall Rockwell, 1970 ..... Canyon  
Richard Friemel, 1970 ..... Rt. 1, Canyon  
Leonard Batehorst, 1972 ..... Rt. 1, Canyon  
Committee meets on the first Monday of each month at 8:00 p.m., 1710 5th Ave., Canyon, Texas.

# PRE-PLANT IRRIGATION

By LEON NEW,  
Area Irrigation Engineer  
Texas Agricultural Extension Service

★ ★ ★



LEON NEW  
Area Irrigation Engineer

Pre-plant irrigation — when, how much, and does it increase profits?

These three questions are prominent in the minds of High Plains irrigation farmers about this time of year. More than five million acres of irrigated crop land are subject to pre-plant irrigation most years. An average six-inch irrigation on this acreage is 2,500,000 acre feet of water. Cost of applying a pre-plant irrigation on this amount of crop land is about \$37,500,000 when figured at \$15 an acre foot. A six-inch pre-plant irrigation costs \$7.50 per acre when figured on the same basis. At this price, precision management of pre-plant irrigation water is essential. Avenues of potential cost reductions demand constant investigation.

## WHAT PREPLANT IRRIGATION CAN DO

Pre-plant irrigation water is somewhat of a special giant that rises to the occasion when needed. Not only does it provide seed bed moisture to get crops started on time but it allows them to get maximum use of an already short growing season. Soil moisture — fertilizer reactions are also superior when the crop is planted at the optimum time.

Pre-plant irrigation water applied late in the season boosts early seedling growth with sub-soil moisture from the top portion of the root zone. This moisture gets the crop off to a good start. Should dry periods occur later when adequate moisture is essential, the roots can reach farther down and pick up deep moisture stored during pre-plant irrigation.

## WHEN SHOULD PREPLANT IRRIGATIONS BE APPLIED?

Traditional, time proven pre-plant irrigation completion dates have been as close to planting as growing crop

demands allowed. Lower well capacities have reduced the irrigating rate and spread pre-plant applications over longer periods. Studies have been made on water losses from early pre-plant irrigations on the slowly permeable Pullman soils at the USDA Southwestern reat Plains Research Center at Bushland. These show that about one-half of the four to six inches of pre-plant irrigation remained in the soil three to five weeks after irrigations. The total amount of moisture gained from pre-plant irrigation and late fall through spring rainfall was about the same regardless of the month of application. When compared to early pre-plant applications, April and early May irrigations were superior in providing moisture for early seedling growth and germinating weeds and volunteer grain sorghum. About 30 percent of the total rainfall and irrigation water was in storage for future plant use at planting time.

Early season applications stored

★ ★ ★



Efficient irrigation water management is based on a good knowledge of the water intake rate and holding capacity of the soil. These soil characteristics, an investigation of sub-soil moisture prior to pre-plant irrigation and the well capacity can be correlated to stretch irrigation water over maximum acreage.



more irrigation water but the wet soil following irrigation decreased rainfall storage between irrigation and planting time. Rainfall following irrigation usually did not wet the soil below the depth previously wet by irrigation. The only exception was 10 inches of rainfall over a 30-day period in late spring, 1965.

**HOW MUCH WATER TO APPLY**

The amount of pre-plant irrigation water that should be applied depends upon the amount of moisture in the soil before irrigation begins. Soils that are dry deep need to have the entire root zone filled by pre-plant irrigation. Soils with moderate to good deep moisture will hold only a medium to light irrigation without losses to deep percolation. Heavy soils can hold a total of eight to nine inches of available water while mixed soils hold six to seven inches. The slow intake rate of the Pullman soils must be taken into consideration since it may limit the degree to which the root zone can be filled. Only the irrigation water needed to finish filling the effective soil root zone will be profitable in crop production.

Studies have been conducted at the Texas A&M University Agricultural Research and Extension Center at Lubbock in managing available pre-plant irrigation water. Data indicates that the amount of pre-plant irrigation that is profitable is directly related to the summer irrigation capacity or rate. Producers with irrigating capacity to cover their planted acreage with one or more timely summer irrigations can use lighter pre-plant irrigations (three to four inches) rather than six to eight inches and still produce about the same yields. Cotton yields at the Center averaged only 19 pounds more per acre with eight-inch pre-plant irrigations than with four-inch. Both test plots were irrigated twice during the summer.

The four inch difference in the pre-plant amount was found to be more profitable when used timely to supplement rainfall during the growing season. Yield increases during the study averaged 70 pounds more with two summer irrigations than with one. Both of these water management practices used 12 inches of irrigation water — an eight-inch pre-plant and one four-inch summer irrigation and a four-inch pre-plant and two four-inch summer irrigations.

These pre-plant studies also show that producers who have trouble covering planted acreage with one summer irrigation may benefit from a larger pre-plant application — preferably one that fills the root zone. This will require four to eight inches, depending on the initial soil moisture, texture and depth. Limited summer water can be more effective by being applied timely through alternate furrow irrigation.

Producers with only limited irrigation water should plant skip-row and irrigate only the planted area since they cannot cover all of a solid planted crop during the summer. Two in and one out cotton that received a pre-plant plus one summer irrigation produced yields of more than 100 pounds

—continued on page 4



Judge Howard C. Davison of the 99th District Court in Lubbock, is shown addressing the group at the swearing-in-ceremony. Left to right, Ross Goodwin, Judge Davison, Russell Beans and John Douglas Pitman.



Judge Howard C. Davison is shown above as he swears in two recently-elected Water District Board members. Left to right, Ross Goodwin, Muleshoe, Judge Davison, Lubbock and John Douglas Pitman, Hereford. Each man was elected to a two-year term.



Effectiveness of irrigation methods, practices and skills are shown by the amount of water applied during an irrigation and its influence on profits. The number of rows set and for how long determines the gross irrigation amount from a specific irrigation well.



Mr. Russell Bean, President of the Board of Directors of the High Plains Water District, acted as master of ceremonies at the swearing-in-ceremony. To the right is John Douglas Pitman the new Board member from Hereford.

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**Oath . . .**

—continued from page 1

serve two-year terms on the five-man District Board. The other members on the Board are Mr. Russell Bean, President, from Lubbock; Chester Mitchell, Vice President from Lockney, and Mr. Weldon Newsom, Secretary-Treasurer of Morton.

**PRECINCT NO. 3  
PETITIONS DISTRICT**

A petition has been filed with the Board of Directors of the High Plains Underground Water Conservation District No. 1 asking for the annexation of Commissioner's Precinct No. 3 of Crosby County into the Water District.

The Board has set the hearing for March 14, at 10 a.m. in the Community Center in Lorenzo.

Commissioner's Precinct No. 3 of Crosby County joins Lubbock County on the east and includes the town of Lorenzo.

All interested individuals are urged to attend and voice their opinions, either for or against Commissioner's Precinct No. 3 of Crosby County becoming a part of the Water District.

**Bill . . .**

—continued from page 1

an emergency and an imperative public necessity that the Constitutional Rule requiring bills to be read on three days in each house be suspended, and this Rule is hereby suspended, and that this Act take effect and be in force from and after its passage, and it is so enacted.

The Board of Directors of the High Plains Underground Water Conservation District No. 1, realizing the increasing cost of tax collecting and assessing, have introduced this bill which will enable the Board of Directors to increase the amount paid to the local tax collectors and assessors.



## Water District Election Results . . .

—continued from page 1

in counties within the District have a representative on the County Boards.

The newly elected County Committeemen are:

**ARMSTRONG COUNTY**  
*Commissioner's Precinct No. 3*  
 Carroll Rogers, Wayside

*Hold over Committeemen are:*  
 John Patterson, Wayside; Foster Parker, Happy; Guy Watson, Wayside; and James Bible, Wayside.

**BAILEY COUNTY**  
*Committeeman-at-large*  
 Jessie Ray Carter, Muleshoe

*Hold over Committeemen are:*  
 Lloyd Throckmorton, Muleshoe; Ernest Ramm, Muleshoe; W. L. Welch, Maple; and R. L. Davis, Maple.

**CASTRO COUNTY**  
*Commissioner's Precinct No. 1*  
 John Gilbreath, Hart

*Hold over Committeemen are:*  
 Dale Maxwell, Dimmitt; Frank Wise, Dimmitt; Donald Wright, Dimmitt; and Morgan Dennis, Hereford.

**COCHRAN COUNTY**  
*Commissioner's Precinct No. 4*  
 Keith Kennedy, Morton

*Hold over Committeemen are:*  
 Ronald Coleman, Morton; D. A. Ramsey, Morton; Hugh Hansen, Morton; and Don Keith, Morton.

**DEAF SMITH COUNTY**  
*Commissioner's Precinct No. 2*  
 W. L. Davis, Jr. Hereford

*Hold over Committeemen are:*  
 Billy Wayne Sission, Hereford; Frank Zinser, Hereford; L. B. Wortham, Hereford; and Harry Fuqua, Hereford.

**FLOYD COUNTY**  
*Committeeman-at-large*  
 Melvin Jarboe, Floydada

*Hold over Committeemen are:*  
 Pat Frizzell, Lockney; Tate Jones, Floydada; M. M. Julian, South Plains; M. J. McNeill, Floydada

**HALE COUNTY**  
*Commissioner's Precinct No. 2*  
 W. D. Scarborough, Jr., Petersburg

*Hold over Committeemen are:*  
 Charles Schuler, Petersburg; Don Hegi, Petersburg; Harold D. Rhodes, Petersburg; J. C. Alford, Petersburg.

**HOCKLEY COUNTY**  
*Commissioner's Precinct No. 4*  
 Bryan Daniel, Levelland

*Hold over Committeemen are:*  
 Ewel Exum, Ropesville; J. E. Wade, Littlefield, Jimmy Price, Levelland; and H. R. Phillips, Levelland.

**LAMB COUNTY**  
*Commissioner's Precinct No. 3*  
 W. W. Thompson, Spade

*Hold over Committeemen are:*  
 Gene Templeton, Earth; Jack Thomas, Olton; Lee Roy Fisher, Sudan; Artis Barton, Earth.

**LUBBOCK COUNTY**  
*Commissioner's Precinct No. 2*  
 Alex Bednarz, Slaton

*Hold over Committeemen are:*  
 Glenn Blackmon, Shallowater; R. F. (Bob) Cook, Idalou; Bill Darman, Lubbock; and Andrew (Buddy) Turnbow, Lubbock.

**LYNN COUNTY**  
*Committeeman-at-large*  
 Dale Zant, Wilson

*Hold over Committeemen are:*  
 Roy Lynn Kahlich, Wilson; Roger Blakney, Wilson; Reuben Sander, Slaton; and O. R. Phifer, Jr., New Home.

**PARMER COUNTY**  
*Commissioner's Precinct No. 3*  
 Webb Gober, Farwell

*Hold over Committeemen are:*  
 Guy Latta, Friona; Henry Ivy, Friona; Jim Ray Daniel, Friona; and Edwin Lide, Bovina.

**POTTER COUNTY**  
*Commissioner's Precinct No. 4*  
 F. G. Collard, Amarillo

*Hold over Committeemen are:*  
 Fritz Meneke, Amarillo; Jim Line, Bushland; Vic Plunk, Amarillo, and Temple Rodgers, Amarillo.

**RANDALL COUNTY**  
*Committeeman-at-large*  
 Leonard Batehorst, Canyon

*Hold over Committeemen are:*  
 R. B. Gist, Canyon; Carl Hartman, Canyon; Marshall Rockwell, Canyon; and Richard Friemel, Canyon.

## Pre-Plant Irrigation . . .

—continued from page 3

per acre above solid planted cotton that received only a pre-plant irrigation.

### OUTLOOK FOR 1969

How about pre-plant irrigation for 1969? Deep moisture is better under many farms than the surface dryness in January and early February might have indicated. A soil moisture survey made since harvest by the USDA Agricultural Meteorology Service at the Lubbock Center shows the amount of soil moisture available for plant use in the root zone of 14 South Plains Counties.

The survey shows that deep soil moisture in many areas is comparable to that of 1968; however, it also shows that some areas are dry. An investigation of the amount of moisture within the soil-root zone on 1969 crop land along with holding off for rainfall may save on pumping costs and water. There is an 80 per cent probability that rainfall will supply two inches of moisture by May 10. Alter-

nate furrow and row streams with a head that rapidly pushes the water on through may well be appropriate in 1969 for the mixed soils that have good moisture.

### HOW TO ESTIMATE WATER USE

Gross water use amounts per acre have a big influence on profits. Pre-plant and summer irrigations can be easily estimated and later evaluated using the irrigation guide below. This guide shows the inches of water released during 12 and 24 hour sets, when the pump capacity and number, width and length of furrows for a particular irrigation system and practice are used. For example, a 400 gallon per minute well irrigating 22 one-fourth mile 40 inch furrows for 12 hours applies a five-inch gross irrigation. With the same well and number of furrows but one-half mile long and on 24-hour sets, the gross irrigation amount is the same five inches. When alternate furrows are irrigated, the per acre irrigation is one-half — in this case, two and one half inches.

### IRRIGATION GUIDE

**40" FURROWS**  
 12 HOUR SET — ¼ MILE  
 AND  
 24 HOUR SET — ½ MILE

**30" FURROWS**  
 12 HOUR SET — ¼ MILE  
 AND  
 24 HOUR SET — ½ MILE

40" FURROWS							30" FURROWS					
12 HOUR SET — ¼ MILE							12 HOUR SET — ¼ MILE					
AND							AND					
24 HOUR SET — ½ MILE							24 HOUR SET — ½ MILE					
IRRIGATION AMOUNT							IRRIGATION AMOUNT					
3.5"	4"	4.5"	5"	5.5"	6"	PUMP GPM	3.5"	4"	4.5"	5"	5.5"	6"
13	15	17	19	21	23		10	11	13	14	15	17
No. Rows	No. Rows	No. Rows	No. Rows	No. Rows	No. Rows	PUMP GPM	No. Rows	No. Rows	No. Rows	No. Rows	No. Rows	No. Rows
16	14	12	11	10	8	200	20	18	16	14	12	12
19	16	14	14	12	11	250	26	22	20	18	16	14
23	20	18	16	14	13	300	30	26	24	22	20	18
26	23	20	18	17	16	350	36	30	28	24	22	20
30	26	24	22	20	18	400	40	36	32	28	26	24
34	30	26	24	22	20	450	46	40	36	32	28	26
38	32	28	26	24	22	500	50	42	40	36	32	30
42	36	32	28	26	24	550	56	48	44	38	36	32
46	40	34	32	28	26	600	60	52	46	42	38	36
50	42	38	34	32	28	650	66	58	50	46	42	38
54	46	40	36	34	30	700	70	62	54	50	44	42
56	50	44	40	36	32	750	76	66	58	52	48	44
62	52	46	42	38	34	800	80	70	62	54	52	46

Locate the capacity of your irrigation pump in the center column under the PUMP GPM heading. The data to the left of the PUMP GPM column are for 40-inch furrows, to the right 30-inch furrows. From your PUMP GPM, read horizontally to the number of rows set. Read the IRRIGATION AMOUNT at the top. Example: PUMP GPM is 500, 12 HOUR SET; the NO. of ¼ mile ROWS are 38, AMOUNT of irrigation is 3.5". The same example represents the gross irrigation amount for a 24 HOUR SET on ½ mile rows — twice the pumping time and water on twice the row length.

Irrigation amounts for 24 HOUR SETS on ¼ mile furrows are twice that shown for 12 HOUR SETS. Gross amounts for 12 HOUR SETS on ½ mile furrows are ½ that shown for 24 HOUR SETS.

**Water Is Your Future, Conserve It!**



# THE Cross SECTION

A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 15—No. 10

"THERE IS NO SUBSTITUTE FOR WATER"

March, 1969

## OBSERVATION WELL RECORDS . . .

### THE ANNUAL WATER STATEMENT, 1968-1969

During the first two weeks in January 1969, personnel of the High Plains Underground Water Conservation District No. 1 and the Texas Water Development Board measured the depths to water in 728 "observation" wells within the District.

The January 1962, 1968, and 1969 depths to water below land surface measurements made in observation wells in Castro, Floyd, Lubbock and Parmer Counties, and those wells in

program are owned by the District or the State. Permission to measure these wells is secured from the landowner, or his agent, before such wells are added to the program. Almost all of the observation wells are farmer-owned, irrigation wells. The majority of these wells are equipped with large capacity turbine pumps.

#### METHOD OF MEASURING

Practically all of the annual depth

well-head. The same measuring point must be used for each annual measurement, in order to provide for more comparable depth to water records. The depth to water below the measuring point is then adjusted to a common land surface datum, by subtracting the height of the measuring point above land surface — usually one to two feet — from the depth to water measurement made therefrom. Depths to water below land surface datum are listed in the tables.

#### VALIDITY OF MEASUREMENTS

The depths to water, as listed in the tables, were taken directly from field measurement records. If the individual measuring a well did not note any circumstance or condition that would reflect upon the authenticity of that water-level measurement, the measurement was listed as reported. No attempt was made to screen these data. This is to say, no attempt was made to throw out any measurement that appeared to be in error when compared with previous water-level records. However, it is apparent that a limited number of such measurements are not representative of the static water level in the well to which the measurement was accredited.

The principal conditions that result in invalid static, water-level measurements are:

- 1) Measured well had been pumped recently.
- 2) Nearby well pumping, or had been pumped recently.
- 3) Wet casing and/or pump column (condensation and/or algae in well).

- 4) Failure to check an apparent valid water level measurement (not measuring the well two or more times).

- 5) Arithmetical errors made adjusting measured depths to corresponding depths below the land surface datum.

- 6) Measurement made from wrong measuring point at the well head.

- 7) Measurement made in wrong well. Measuring from the wrong measuring point, and particularly measuring the wrong well, are the two most prevalent causes for reporting invalid water-level data.

#### COMPUTATIONS

All of the arithmetical operations involving the January 1962 through

—continued on page 8



Inserting steel tape in well.

the District in Armstrong, Bailey, Cochran, Deaf Smith, Hale, Hockley, Lamb, Lynn, Potter, and Randall Counties are presented in the tables on pages 2 through 7. Zeros (0.0) are shown for those years where depth to water measurements, and corresponding decline value, are not available.

#### OBSERVATION WELLS

An observation well is a well that has been selected for inclusion in the annual water-level measuring program. This program consists primarily of the measurement of the depths to the static water levels in these wells in January of each year. A well that is maintained in the records as measurable, and/or subject to annual measurement, is considered a current well.

All observation wells are privately owned — none of the wells in this

to water measurements are made with steel, "highway-drag" tapes. These tapes, spooled in 300 and 500 foot lengths, are graduated in feet throughout their entire length — with the first (free end) 30-feet graduated in tenth and hundredths of a foot.

After consulting the water-level records, the individual measuring the well applies carpenter's chalk (which turns dark blue in color upon contact with water) to the free-end, graduated part of the tape, and enters enough tape into the well annulus — the space between the pump column and the well casing — to insure immersion of a part of the chalked tape. The depth to water is determined by subtracting the amount (in feet, tenth and hundreds of a foot) of the wetted tape from the value of the footmark held at the measuring point at the

## ANNEXATION ELECTION

The Board of Directors of the High Plains Underground Water Conservation District No. 1 have called a confirmation of annexation election to be held April 22 in each of the 14 counties within the District and in Commissioner's Precinct No. 3 of Crosby County.

The residents of Commissioner's Precinct No. 3 of Crosby County have petitioned the Water District to annex certain eligible lands of Commissioner's Precinct No. 3 into the District.

Residents within the District must vote to accept Precinct No. 3 and the residents of Precinct No. 3 must vote to join the District.

The ballot is divided into two propositions to meet the requirements of the statutes of the State of Texas.

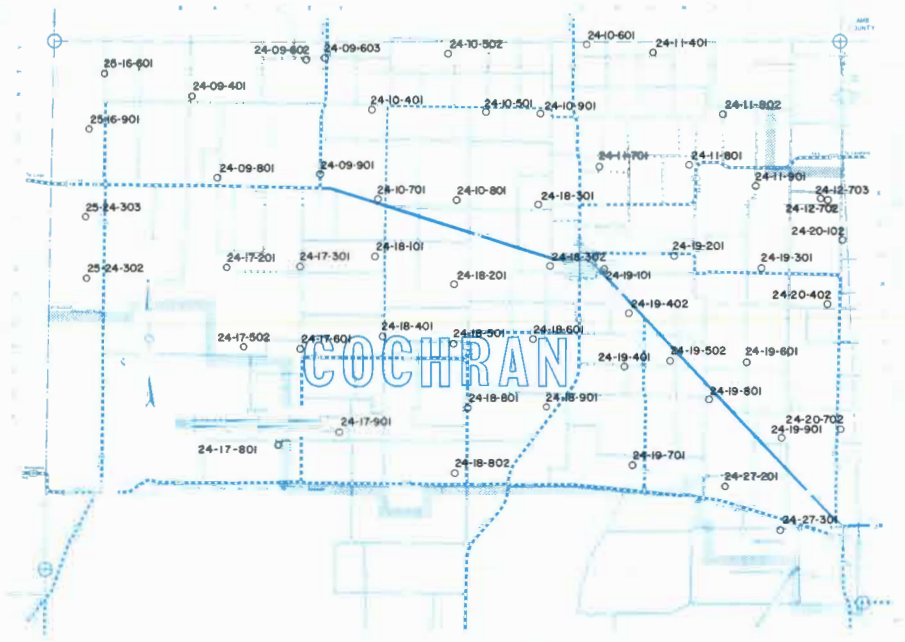
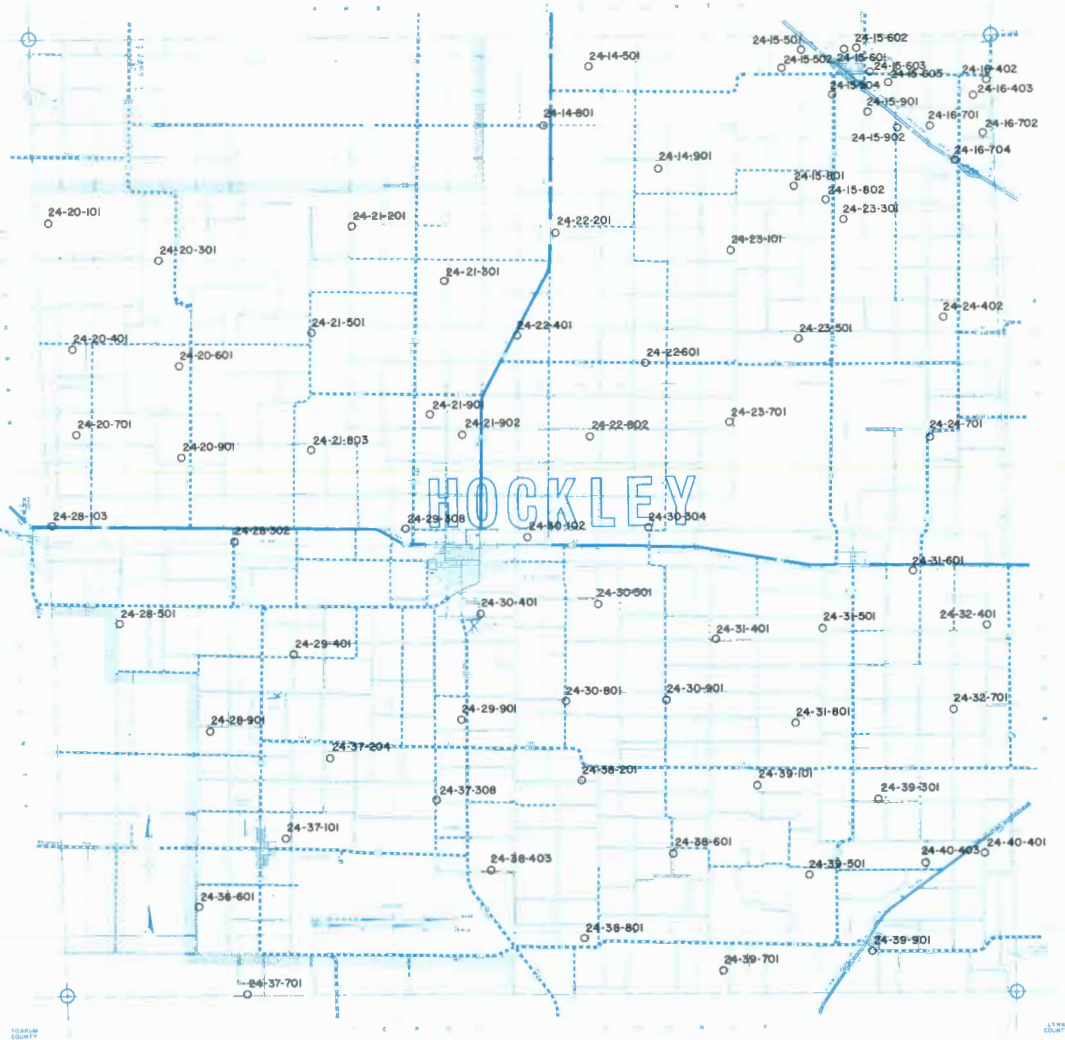
*Statutes of the State of Texas require that the voters vote on two propositions, and that both propositions be favored by a majority of those voting before annexation can take place. The first proposition asks whether the voter wishes to vote to join the High Plains Underground Water Conservation District No. 1. The second proposition asks whether the voter is willing to pay taxes at the same rate that those people now in the Water District pay taxes. At the present time this tax would be .05c per \$100.00 of value based on the valuations of the Crosby County Tax Assessor. Voters who favor joining the Water District must vote FOR both propositions.*

—continued on page 8



Annual measurement stickers (A) and well identification plate (B).





**HOCKLEY COUNTY**

Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year	Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
24-14-501	0.0	108.73	106.62	+2.11	0.20	24-23-701	0.0	104.46	104.13	+0.33	1.22
24-14-801	50.27	56.23	57.30	1.07	1.00	24-24-402	136.78	152.01	150.90	+1.11	1.54
24-14-901	0.0	99.55	99.12	+0.43	0.53	24-24-701	0.0	126.66	126.80	0.14	0.43
24-15-501	63.90	72.15	74.19	2.04	1.47	24-28-103	0.0	147.59	149.11	1.52	1.73
24-15-502	0.0	79.07	77.85	+1.22	0.49	24-28-302	0.0	126.85	125.90	+0.95	*
24-15-504	61.90	67.68	66.70	+0.98	0.69	24-28-501	0.0	150.26	149.45	+0.81	0.92
24-15-601	90.02	106.03	108.50	2.47	2.64	24-28-901	0.0	163.18	160.20	+2.98	1.55
24-15-602	103.03	118.05	0.0	0.0	2.25	24-29-308	0.0	145.87	144.20	+1.67	2.13
24-15-603	98.32	113.65	115.83	2.18	2.50	24-29-401	0.0	143.40	141.88	+1.52	0.47
24-15-605	84.26	94.05	94.22	0.17	1.42	24-29-901	169.44	189.30	190.42	1.12	3.00
24-15-801	129.00	0.0	134.22	0.82**	0.72	24-30-102	0.0	142.65	142.14	+0.51	2.92
24-15-802	173.30	178.66	176.98	+1.68	0.53	24-30-304	0.0	103.92	104.50	0.58	1.40
24-15-901	41.20	42.57	41.44	+1.13	0.03	24-30-401	117.17	130.54	132.24	1.70	2.15
24-15-902	34.64	41.30	44.60	3.30	1.42	24-30-501	0.0	125.62	125.42	+0.20	2.20
24-16-402	124.29	130.47	128.94	+1.53	0.66	24-30-801	0.0	170.15	173.70	3.55	1.83
24-16-403	93.55	105.88	106.60	0.72	1.86	24-30-901	0.0	155.85	155.92	0.07	1.81
24-16-701	58.38	63.87	64.50	0.63	0.87	24-31-401	0.0	130.03	129.21	+0.82	1.95
24-16-702	85.47	93.26	92.30	+0.96	0.98	24-31-501	0.0	80.32	80.80	0.48	1.19
24-16-704	85.60	107.44	105.41	+2.03	4.53	24-31-601	113.81	119.88	117.50	+2.38	0.53
24-20-101	129.37	158.03	152.47	+5.56	4.78	24-31-801	0.0	145.97	145.62	+0.35	0.71
24-20-301	115.21	132.13	132.90	0.77	2.53	24-32-401	99.50	104.50	102.48	+2.02	0.43
24-20-401	111.08	123.19	125.18	1.99	2.01	24-32-701	0.0	116.16	115.48	+0.68	0.62
24-20-601	133.24*	149.30	151.38	2.08	2.59	24-36-601	0.0	145.95	144.62	+1.33	0.12
24-20-701	142.00	145.70	147.33	1.63	0.79	24-37-101	0.0	145.46	144.25	+1.21	1.52
24-20-901	120.72	141.47	140.41	+1.06	2.56	24-37-204	0.0	145.54	144.92	+0.62	1.26
24-21-201	0.0	44.17	44.18	0.01	0.94	24-37-308	0.0	146.85	145.39	+1.46	2.47
24-21-301	81.87	90.65	91.03	0.38	1.31	24-37-701	151.00	152.15	152.60	0.45	0.23
24-21-501	137.18	153.96	156.15	2.19	2.71	24-38-201	0.0	168.86	170.23	1.37	2.63
24-21-803	0.0	157.62	160.40	2.78	2.86	24-38-403	0.0	161.30	160.55	+0.75	1.46
24-21-901	141.77	156.00	157.11	1.11	2.19	24-38-601	119.80	132.07	133.14	1.07	1.91
24-21-902	150.52	169.20	168.90	+0.30	2.63	24-38-801	0.0	167.00	169.10	2.10	2.36
24-22-201	0.0	78.70	78.30	+0.40	0.63	24-39-101	0.0	0.0	154.58	0.17**	1.98
24-22-401	0.0	86.05	86.22	0.17	0.41	24-39-301	0.0	151.30	151.76	0.46	1.58
24-22-601	0.0	100.84	100.82	+0.02	0.43	24-39-501	0.0	136.83	136.52	+0.31	1.12
24-22-802	0.0	125.08	123.90	+1.18	1.49	24-39-701	0.0	119.28	116.85	+2.43	1.63
24-23-101	0.0	108.88	109.21	0.33	0.71	24-39-901	90.70	95.54	96.10	0.56	0.77
24-23-301	178.60	190.00	194.62	4.62	2.29	24-40-401	131.52	143.25	142.00	+1.25	1.50
24-23-501	0.0	104.84	105.01	0.17	0.69	24-40-403	0.0	148.75	148.55	+0.20	1.46

\*Data not available \*\*Computed decline

**COCHRAN COUNTY**

Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year	Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
24-09-401	0.0	86.78	86.46	+0.32	*	24-10-501	92.96	94.40	95.03	0.63	0.30
24-09-602	103.68	120.80	119.31	+1.49	2.23	24-10-502	86.49	88.70	86.91	+1.79	0.06
24-09-603	99.31	118.57	115.39	+3.18	2.08	24-10-601	88.90	96.25	0.0	0.0	1.22
24-09-801	120.76	124.40	123.08	+1.32	0.33	24-10-701	148.16	162.90	156.41	+6.49	1.18
24-09-901	93.53	104.53	102.57	+1.96	1.29	24-10-801	123.98	132.70	133.82	1.12	1.41
24-10-401	106.30	112.20	110.09	+2.11	0.54	24-10-901	91.72	96.15	93.80	+2.35	0.30
						24-11-401	127.52	0.0	0.0	0.0	4.75
						24-11-701	122.22	127.70	128.25	0.55	0.86
						24-11-801	103.43	109.13	106.77	+2.36	0.48
						24-11-802	98.24	109.30	108.27	+1.03	1.43
						24-11-901	115.09	124.44	124.69	0.25	1.37
						24-12-702	120.11	148.38	151.91	3.53	4.54
						24-12-703	117.23	144.25	137.47	+6.78	2.89
						24-17-201	0.0	147.41	144.61	+2.80	*
						24-17-301	127.16	139.82	140.14	0.32	1.74
						24-17-502	0.0	159.78	153.95	+5.83	*
						24-17-601	136.43	148.29	148.96	0.67	1.79
						24-17-801	0.0	155.30	156.06	0.76	0.76
						24-17-901	159.78	175.90	167.14	+8.76	1.05
						24-18-101	143.30	149.61	149.83	0.22	0.93
						24-18-201	157.34	174.60	175.07	0.47	2.53
						24-18-301	125.82	131.05	130.25	+0.80	0.63
						24-18-302	142.73	159.50	159.27	+0.23	2.36
						24-18-401	138.06	149.97	151.89	1.92	1.98
						24-18-501	0.0	194.02	194.78	0.76	*
						24-18-601	156.47	0.0	168.66	0.35**	2.30
						24-18-801	173.95	199.96	183.87	+16.09	1.42
						24-18-802	161.67	0.0	172.37	1.18**	1.67
						24-18-901	115.37	115.20	115.60	0.40	0.03
						24-19-101	129.72	0.0	0.0	0.0	3.36
						24-19-201	134.12	147.32	150.60	3.28	2.35
						24-19-301	150.37	166.25	166.14	+0.11	2.25
						24-19-401	140.57	153.03	152.33	+0.70	1.68
						24-19-402	133.03	148.38	146.10	+2.28	1.87
						24-19-502	152.18	175.22	167.57	+7.65	2.20
						24-19-601	144.57	153.17	154.41	1.24	1.41
						24-19-701	144.07	159.27	0.0	0.0	2.53
						24-19-801	144.35	164.50	162.07	+2.43	2.53
						24-19-901	124.93	126.00	126.59	0.59	0.24
						24-20-102	120.04	150.90	143.61	+7.29	3.37
						24-20-402	134.61	149.27	149.37	0.10	2.11
						24-20-702	143.28	159.70	154.82	+4.88	1.65
						24-27-201	168.70	180.30	184.88	4.58	2.31
						24-27-301	176.66	181.00	180.62	+0.38	0.57
						24-28-401	0.0	184.30	184.56	0.26	0.26
						25-16-601	55.40	0.0	70.81	3.41**	1.30
						25-16-901	0.0	90.91	90.02	+0.89	*
						25-24-302	0.0	148.67	146.82	+1.85	*
						25-24-303	0.0	127.02	126.65	+0.37	*

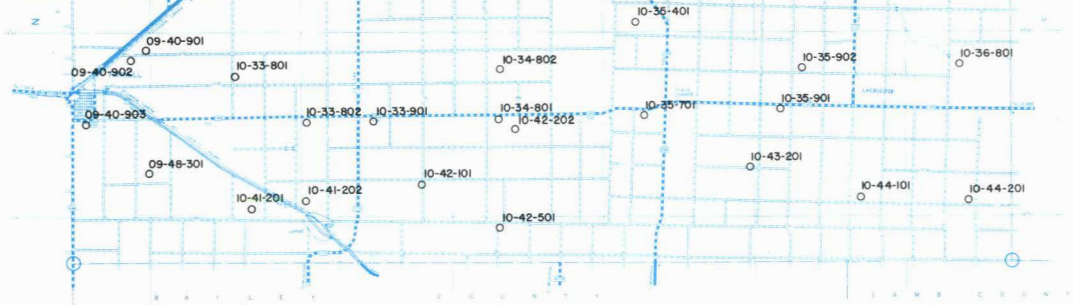
\*Data not available \*\*Computed decline

**ARMSTRONG COUNTY**

Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
11-12-401	107.50	113.95	115.03	1.08	1.076
11-12-701	112.65	127.72	129.91	2.19	2.466
11-12-702	0.0	146.37	145.04	+1.33	3.643
11-12-801	124.80	143.36	139.74	+3.62	2.134
11-12-802	124.90	143.46	142.71	+0.75	1.606
11-12-803	108.90	120.30	121.90	1.60	1.857
11-12-901	109.00	120.80	122.15	1.35	1.879
11-12-904	100.80	106.62	106.22	+0.40	0.774
11-13-701	95.48	109.53	107.26	+2.27	1.683



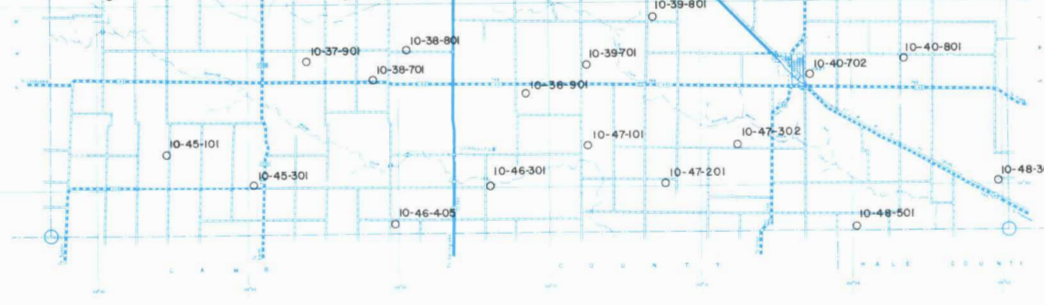




**PARMER COUNTY**

Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year	Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
09-24-601	286.05	317.21	321.86	4.65	4.96	10-28-201	0.0	250.61	263.58	12.97	2.63
09-32-301	306.14	0.0	0.0	0.0	*	10-28-501	0.0	272.61	274.86	2.25	2.79
09-32-901	0.0	227.23	231.62	4.39	*	10-33-101	238.25	270.14	273.01	2.87	4.97
09-40-601	239.59	0.0	0.0	0.0	2.59	10-33-301	202.86	243.03	252.38	9.35	8.11
09-40-901	226.64	249.93	251.55	1.62	3.56	10-33-401	241.45	263.88	271.59	7.71	1.54
09-40-902	198.53	221.03	224.97	3.94	4.45	10-33-601	237.35	267.21	270.59	3.38	4.69
09-40-903	206.38	246.29	229.60	+16.69	3.32	10-33-801	203.85	0.0	0.0	0.0	8.18
09-48-301	191.54	224.45	210.45	+14.00	1.10	10-33-802	168.47	195.30	198.65	3.35	4.20
10-17-301	0.0	205.31	191.81	+13.50	0.16	10-33-901	165.98	197.16	196.44	+0.72	4.35
10-17-401	241.84	268.35	273.19	4.84	3.26	10-34-101	0.0	203.42	206.39	2.97	*
10-17-501	230.00	252.61	256.92	4.31	3.85	10-34-301	186.80	203.28	205.61	2.33	2.69
10-18-501	0.0	289.27	291.86	2.59	5.16	10-34-401	235.85	251.18	266.85	15.67	4.43
10-18-701	203.35	239.62	245.65	6.03	6.04	10-34-801	175.46	211.46	202.05	+9.41	3.17
10-18-901	207.68	233.37	243.03	9.66	5.05	10-34-802	201.04	223.21	227.04	3.83	3.71
10-19-101	232.00	258.89	264.63	5.74	4.66	10-35-304	0.0	196.00	199.67	3.67	3.58
10-19-301	0.0	252.51	265.42	12.91	5.10	10-35-401	204.15	227.30	230.05	2.75	2.85
10-19-601	201.09	215.04	221.71	6.67	2.95	10-35-501	194.50	222.68	220.23	+2.45	3.75
10-20-401	0.0	210.58	220.87	10.29	4.90	10-35-601	169.60	191.91	198.88	6.97	4.18
10-20-502	151.34	161.81	162.37	0.56	1.58	10-35-701	182.78	213.42	217.35	3.93	4.94
10-20-801	144.60	0.0	0.0	0.0	5.71	10-35-901	0.0	238.12	233.96	+4.16	4.73
10-25-101	0.0	318.25	303.74	+14.51	*	10-35-902	196.41	233.34	229.69	+3.65	5.54
10-25-301	274.05	294.14	292.50	+1.64	2.54	10-36-101	165.80	191.98	196.79	4.81	4.43
10-25-501	0.0	169.48	167.74	+1.74	0.88	10-36-601	0.0	206.50	189.50	+17.00	5.05
10-25-701	212.68	248.61	244.42	+4.19	4.17	10-36-801	156.82	198.12	182.00	+16.12	3.60
10-26-101	289.22	315.06	0.0	0.0	4.79	10-41-201	137.28	157.79	164.77	6.98	4.92
10-26-301	272.40	291.38	0.0	0.0	2.75	10-41-202	123.35	145.28	0.0	0.0	3.65
10-26-701	181.40	197.71	197.85	0.14	2.35	10-42-101	138.20	177.69	160.52	+17.17	3.10
10-26-801	0.0	199.25	218.25	19.00	6.12	10-42-202	163.80	191.99	194.32	2.33	4.36
10-27-101	0.0	250.83	254.90	4.07	5.54	10-42-501	124.23	145.25	147.70	2.45	3.60
10-27-301	252.15	279.89	291.67	11.78	5.65	10-43-201	163.85	204.36	193.59	+10.77	4.25
10-27-401	245.37	267.78	272.55	4.77	3.26	10-44-101	0.0	177.60	0.0	0.0	6.25
10-27-501	0.0	311.47	324.28	12.81	4.57	10-44-201	159.70	185.84	0.0	0.0	7.75
10-27-901	208.00	232.89	239.29	6.40	4.47						

\*Data not available

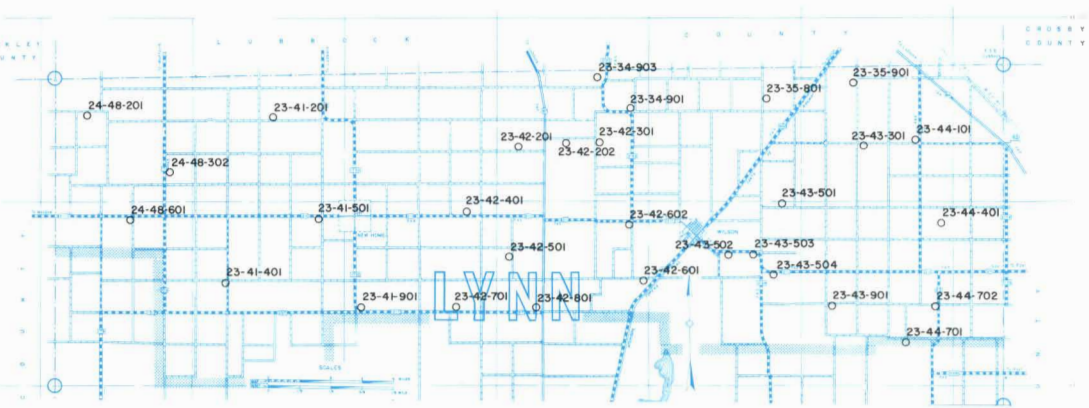


**CASTRO COUNTY**

Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year	Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
10-21-401	108.19	130.49	0.0	0.0	3.85	10-31-601	0.0	152.00	154.15	2.15	3.15
10-21-501	111.83	132.49	137.98	5.49	3.74	10-31-701	202.50	236.33	241.54	5.21	1.57
10-21-601	122.60	146.11	150.66	4.55	4.94	10-31-801	198.38	223.54	229.05	5.51	3.65
10-21-701	163.65	195.42	196.09	0.67	4.63	10-32-201	0.0	158.30	162.14	3.84	2.68
10-21-801	0.0	176.47	180.45	3.98	5.07	10-32-501	125.64	134.92	142.76	7.84	3.17
10-21-901	0.0	147.02	0.0	0.0	4.16	10-32-703	180.03	202.87	214.34	11.47	5.21
10-22-101	137.20	0.0	0.0	0.0	4.21	10-32-801	166.10	190.80	192.75	1.95	3.73
10-22-201	0.0	151.68	154.80	3.12	3.76	10-37-201	155.45	176.65	184.30	7.65	4.45
10-22-301	0.0	119.65	0.0	0.0	1.91	10-37-401	128.85	149.93	153.13	3.20	3.47
10-22-401	106.57	127.49	132.28	4.79	3.67	10-37-601	113.03	129.70	132.15	2.45	2.73
10-22-501	110.43	0.0	130.20	2.34**	4.02	10-37-901	0.0	135.61	138.09	2.48	3.31
10-22-601	87.60	0.0	118.13	4.90**	3.00	10-38-401	126.26	146.50	148.26	1.76	1.87
10-22-801	0.0	141.01	145.39	4.38	3.94	10-38-601	0.0	134.43	0.0	0.0	3.13
10-22-901	123.69	145.58	0.0	0.0	3.46	10-38-701	123.24	140.99	146.36	5.37	3.30
10-23-701	104.63	134.31	121.98	+12.33	*	10-38-801	125.10	142.81	145.74	2.93	2.95
10-23-801	148.50	148.74	148.87	0.13	0.05	10-38-901	113.50	137.85	134.15	+3.70	2.95
10-24-401	176.50	187.31	187.86	0.55	1.62	10-39-101	153.30	179.35	183.40	4.05	4.30
10-24-601	0.0	163.28	158.29	+4.99	*	10-39-401	0.0	155.47	162.96	7.49	4.36
10-24-701	0.0	181.92	184.06	2.14	2.21	10-39-501	129.54	155.90	160.78	4.88	4.46
10-24-801	158.86	178.88	180.75	1.87	3.12	10-39-701	0.0	128.99	137.14	8.15	4.28
10-28-301	224.41	260.48	0.0	0.0	6.01	10-39-801	0.0	143.81	147.85	4.04	3.13
10-29-302	0.0	247.80	254.30	6.50	5.76	10-40-401	138.81	164.89	172.40	7.51	4.80
10-29-601	195.75	244.45	234.32	+10.13	5.51	10-40-501	170.20	194.69	199.85	5.16	4.24
10-29-701	200.89	230.21	235.58	5.37	4.96	10-40-702	130.61	0.0	0.0	0.0	4.06
10-29-901	176.84	217.90	0.0	0.0	4.34	10-40-801	146.92	171.15	175.28	4.13	4.05
10-30-101	0.0	0.0	208.00	1.22**	4.67	10-45-101	134.44	152.69	155.32	2.63	3.29
10-30-201	185.52	214.61	0.0	0.0	4.85	10-45-301	140.91	158.26	163.82	5.56	3.27
10-30-401	0.0	230.78	238.80	8.02	4.50	10-46-301	52.64	72.63	0.0	0.0	3.33
10-30-505	0.0	213.59	216.60	3.01	2.28	10-46-405	136.66	159.49	157.32	+2.17	2.95
10-30-601	185.25	206.36	208.55	2.19	3.51	10-47-101	0.0	124.98	133.64	8.66	4.18
10-30-801	172.18	198.08	204.13	6.05	4.56	10-47-201	0.0	159.56	160.94	1.38	3.66
10-30-901	0.0	219.14	222.44	3.30	3.64	10-47-302	121.76	0.0	145.25	2.48**	4.75
10-31-201	139.18	162.14	163.59	1.45	3.49	10-48-301	112.77	0.0	147.45	5.55**	7.21
10-31-301	0.0	172.29	174.88	2.59	1.89	10-48-501	0.0	139.01	142.47	3.46	4.71
10-31-501	0.0	200.02	199.92	+0.40	1.61						

\*Data not available

\*\*Computed decline



**LYNN COUNTY**

Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year	Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
23-34-901	119.61	136.28	137.80	1.52	2.60	23-42-701	0.0	105.40	103.26	+2.14	*
23-34-903	133.73	159.31	145.52	+13.79	1.60	23-42-801	64.79	69.33	67.95	+1.38	0.45
23-35-801	81.34	87.10	86.61	+0.49	0.79	23-43-301	25.89	38.90	31.66	+7.24	0.82
23-35-901	86.64	90.97	91.32	0.35	0.67	23-43-501	69.95	72.60	72.02	+0.58	0.30
23-41-201	93.83	105.90	106.62	0.72	1.83	23-43-502	74.20	76.10	78.18	2.08	0.57
23-41-401	83.68	91.22	89.10	+2.12	0.77	23-43-503	81.94	86.20	84.41	+1.79	0.35
23-41-501	68.57	73.77	74.25	0.48	0.81	23-43-504	75.68	78.89	78.02	+0.87	0.33
23-41-901	122.97	129.44	128.00	+1.44	0.72	23-43-901	64.74	64.60	63.45	+1.15	*
23-42-201	127.70	131.30	129.12	+2.18	0.01	23-44-101	58.14	69.83	66.80	+3.03	1.24
23-42-202	102.43	123.90	131.76	7.86	4.19	23-44-401	56.19	52.59	45.26	+7.33	*
23-42-301	102.68	103.39	109.20	5.81	0.93	23-44-701	50.74	0.0	83.18	2.30**	*
23-42-401	108.63	119.21	121.70	2.49	1.87	23-44-702	37.58	43.30	36.52	+6.78	*
23-42-501	90.79	102.98	107.88	4.90	2.00	24-48-201	91.70	102.14	101.38	+0.76	1.38
23-42-601	41.11	49.52	51.11	1.59	1.43	24-48-302	99.06	112.08	112.60	0.52	1.93
23-42-602	79.18	86.94	85.51	+1.43	0.90	24-48-601	83.72	93.50	93.32	+0.18	1.37

\*Data not available

\*\*Computed decline



**HALE COUNTY**

Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
11-59-401	127.75	159.85	162.90	3.05	5.02
11-59-402	69.70	89.14	83.30	+5.84	1.94
11-59-501	79.04	81.45	81.60	0.15	0.37
11-59-801	99.28	108.10	107.85		





### FLOYD COUNTY

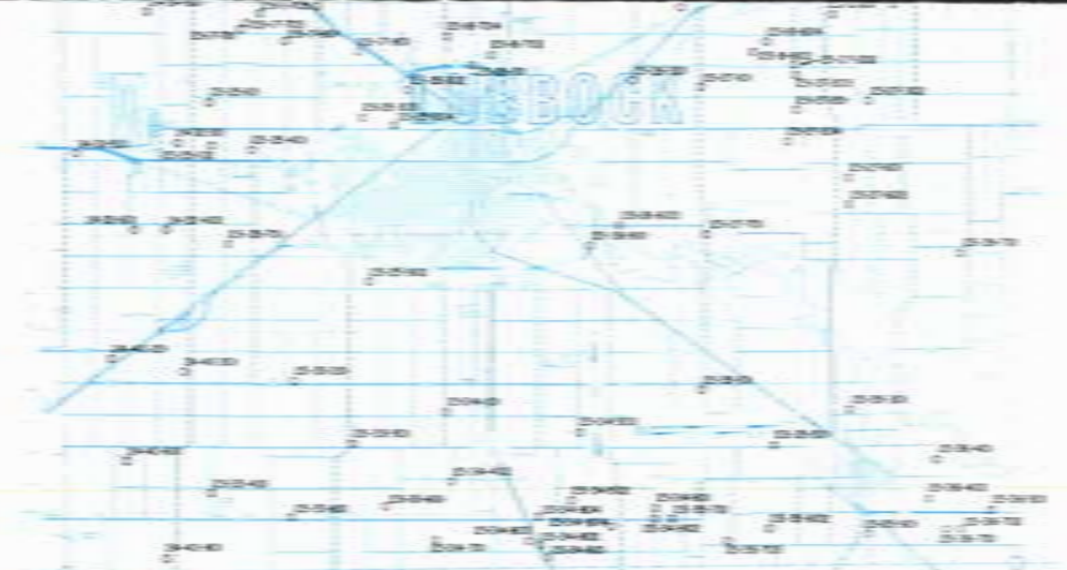
Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year	Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
11-44-901	102.28	136.28	130.15	+6.13	*	11-61-406	0.0	176.46	180.66	4.20	*
11-44-902	0.0	128.71	127.38	+1.33	*	11-61-407	143.79	182.91	186.88	3.97	*
11-45-802	129.68	149.40	151.80	2.40	*	11-61-601	44.64	53.04	52.38	+0.66	*
11-45-803	140.27	0.0	155.02	2.19**	*	11-61-801	153.40	204.41	196.60	+7.81	*
11-45-902	143.26	160.82	164.73	3.91	*	11-61-802	140.83	206.30	194.09	+12.21	*
11-46-701	158.40	185.94	188.87	2.93	*	11-61-901	146.36	185.73	183.72	+2.01	*
11-52-301	109.13	141.89	141.78	+0.11	*	11-62-201	0.0	148.38	141.72	+6.66	*
11-52-302	115.80	146.81	150.24	3.43	*	11-62-401	58.44	59.50	60.59	1.09	*
11-52-303	135.33	171.20	171.50	0.30	*	11-62-601	0.0	157.80	149.40	+8.40	*
11-52-304	127.07	0.0	162.92	5.71**	*	11-62-701	117.98	121.55	123.13	1.58	*
11-52-602	142.30	0.0	0.0	0.0	*	11-62-702	93.08	100.60	99.39	+1.21	*
11-52-603	138.92	173.59	0.0	0.0	*	11-62-801	89.36	102.00	100.54	+1.46	*
11-52-604	132.34	0.0	0.0	0.0	*	11-62-901	171.04	181.62	0.0	0.0	*
11-52-801	127.65	152.29	155.10	2.81	*	11-63-101	154.90	158.96	0.0	0.0	*
11-52-901	143.38	0.0	172.18	3.86**	*	11-63-801	198.42	201.89	202.50	0.61	*
11-52-902	142.30	157.25	160.73	3.48	*	11-64-101	210.18	244.89	234.70	+10.19	*
11-52-903	148.40	161.01	165.64	4.63	*	11-64-401	237.66	0.0	238.40	0.47**	*
11-52-905	146.40	164.86	169.68	4.82	*	11-64-502	0.0	272.40	264.51	+7.89	*
11-52-906	145.20	164.18	172.48	8.30	*	23-04-501	142.75	0.0	182.39	3.14**	*
11-53-101	127.75	182.64	0.0	0.0	*	23-04-601	138.78	0.0	173.30	5.58**	*
11-53-201	126.38	145.14	148.89	3.75	*	23-04-602	148.89	180.55	182.00	1.45	*
11-53-202	126.98	152.64	149.52	+3.12	*	23-04-603	141.68	189.33	186.43	+2.90	*
11-53-203	130.69	143.57	144.87	1.30	*	23-04-801	126.24	157.51	147.62	+9.89	*
11-53-402	143.79	170.51	171.40	0.89	*	23-05-301	153.44	190.98	186.35	+4.63	*
11-53-501	159.74	188.80	188.47	+0.33	*	23-05-501	171.78	206.94	200.86	+6.08	*
11-53-701	146.10	171.78	166.14	+5.64	*	23-05-801	183.10	195.38	0.0	0.0	*
11-53-702	134.38	160.71	158.84	+1.87	*	23-06-101	148.24	165.98	167.37	1.39	*
11-53-703	144.38	172.97	161.80	+11.17	*	23-06-301	155.41	168.69	162.29	+6.40	*
11-54-301	209.24	236.76	0.0	0.0	*	23-06-404	161.47	207.39	203.73	+3.66	*
11-54-401	165.32	174.12	174.30	0.18	*	23-06-701	179.82	223.29	0.0	0.0	*
11-54-901	205.65	0.0	218.81	1.00**	*	23-06-802	183.42	222.83	220.88	+1.95	*
11-55-701	214.70	238.36	229.60	+8.76	*	23-07-101	217.38	229.87	246.45	16.58	*
11-55-901	264.96	287.30	276.29	+11.01	*	23-07-301	0.0	211.04	227.80	16.76	*
11-60-301	132.95	152.49	159.40	6.91	*	23-07-401	0.0	305.36	273.08	+32.28	*
11-60-302	138.73	160.94	164.45	3.51	*	23-07-501	231.16	0.0	286.37	1.14**	*
11-60-303	136.41	157.00	162.00	5.60	*	23-07-601	234.48	292.43	291.34	+1.09	*
11-60-501	122.13	158.75	158.44	+0.31	*	23-07-701	0.0	203.90	207.20	3.30	*
11-60-601	135.91	0.0	0.0	0.0	*	23-08-201	261.73	0.0	267.95	0.90**	*
11-60-602	134.70	165.30	160.38	+4.92	*	23-08-401	0.0	293.29	279.00	+14.29	*
11-60-901	121.36	149.01	151.42	2.41	*	23-08-501	252.58	266.89	266.20	+0.69	*
11-61-101	147.91	167.96	170.80	2.84	*	23-08-701	0.0	275.91	274.88	+1.03	*
11-61-102	151.54	0.0	0.0	0.0	*	23-12-301	138.97	188.60	187.44	+1.16	*
11-61-103	143.08	166.39	0.0	0.0	*	23-13-101	154.76	183.21	185.45	2.24	*
11-61-104	139.57	168.81	172.09	3.28	*	23-13-301	188.22	0.0	0.0	0.0	*
11-61-105	143.73	173.51	0.0	0.0	*	23-14-101	0.0	245.72	230.50	+15.22	*
11-61-203	159.73	188.64	0.0	0.0	*	23-14-301	195.12	214.20	233.36	19.16	*
11-61-204	150.42	180.08	183.13	3.05	*	23-15-201	240.33	265.91	257.94	+7.97	*
11-61-301	37.29	0.0	0.0	0.0	*	23-15-301	258.21	293.07	288.89	+4.18	*
11-61-401	145.89	182.81	185.82	3.01	*	23-15-302	254.32	292.50	285.37	+7.13	*
11-61-403	138.14	176.54	181.25	4.71	*	23-16-101	261.04	311.24	294.50	+16.74	*
11-61-405	0.0	187.43	192.08	4.65	*						

\*Data not available \*\*Computed decline

### POTTER COUNTY

Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
06-49-501	0.0	0.0	197.77	3.18**	3.89
07-56-401	0.0	214.39	216.82	2.43	3.14
07-56-501	0.0	217.04	0.0	0.0	3.37
07-56-601	0.0	204.15	206.22	2.07	3.72

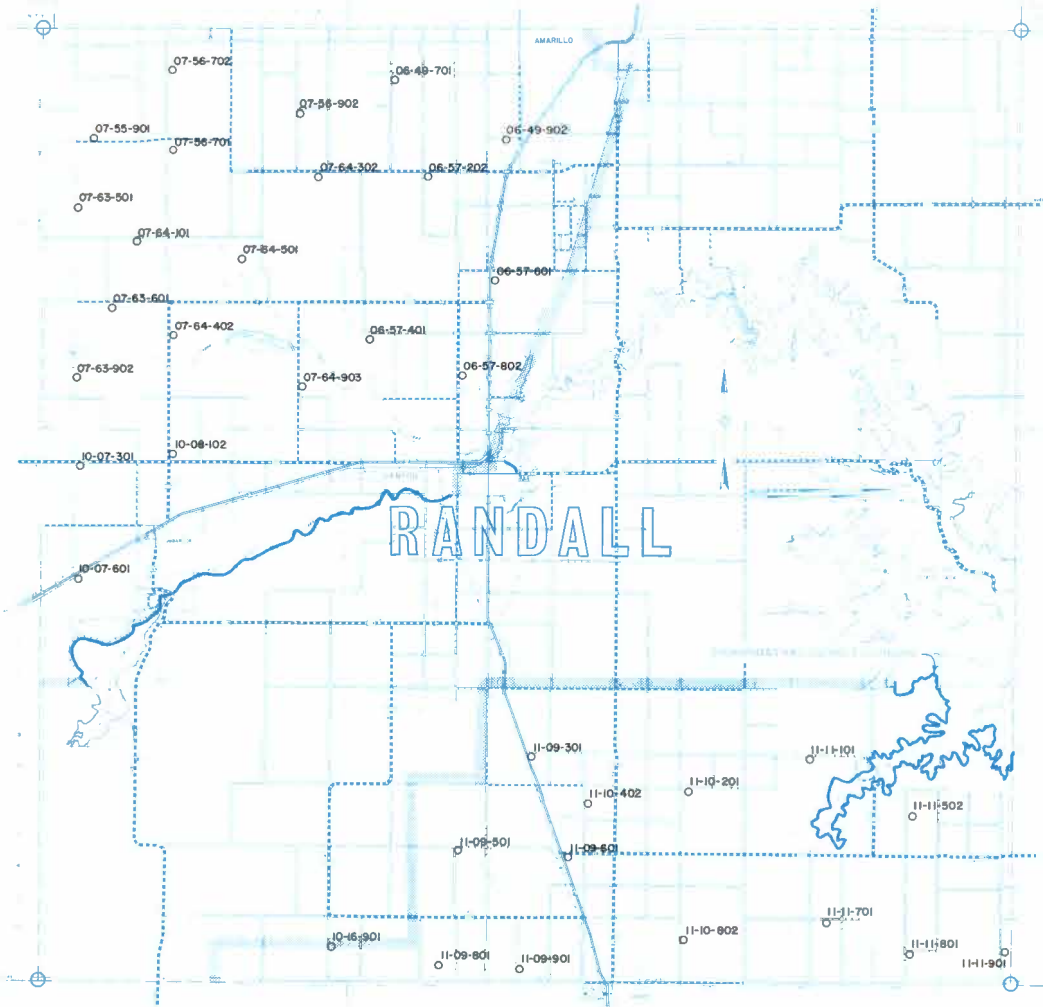
\*Data not available \*\*Computed decline



### LUBBOCK COUNTY

Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year	Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
23-09-501	142.82	157.54	158.10	0.56	2.18	23-26-101	72.30	69.00	67.62	+1.38	0.36
23-09-601	123.09	142.32	146.43	4.11	3.33	23-26-301	89.48	94.68	94.98	0.30	0.69
23-09-701	132.21	0.0	152.66	0.90**	3.73	23-26-603	12.82	6.05	4.90	+1.15	*
23-09-901	169.54	194.60	194.10	+0.50	3.51	23-26-901	49.73	50.30	50.59	0.29	1.06
23-10-501	158.80	173.69	180.15	6.46	3.72	23-27-101	89.26	95.95	95.15	+0.80	0.88
23-10-801	144.55	164.25	166.28	2.03	3.10	23-27-201	84.31	89.46	91.42	1.96	1.27
23-11-401	156.93	0.0	184.98	0.01**	5.60	23-27-202	73.80	86.83	85.40	+1.43	1.66
23-11-601	145.88	162.35	161.61	+0.74	2.25	23-27-203	74.55	0.0	86.74	0.50**	2.55
23-11-701	146.93	177.25	178.50	1.25	4.51	23-27-204	81.85	89.95	91.08	1.13	1.32
23-11-702	142.94	167.50	168.80	1.30	3.70	23-27-302	66.78	80.52	78.40	+2.12	1.66
23-11-901	127.09	157.15	156.05	+1.10	3.25	23-27-601	74.66	85.70	84.87	+0.83	1.46
23-11-902	141.92	159.09	159.12	0.03	2.46	23-27-602	87.10	93.24	90.08	+3.16	0.43
23-11-903	128.61	160.14	161.40	1.26	4.68	23-27-701	0.0	86.76	83.72	+3.04	*
23-12-401	149.53	167.04	175.20	8.16	5.19	23-28-701	59.62	68.90	65.52	+3.38	0.84
23-12-402	150.33	173.34	173.79	0.45	3.35	23-33-201	125.11	130.40	129.68	+0.72	0.43
23-12-803	137.70	168.09	167.05	+1.04	4.19	23-33-401	100.13	105.53	104.50	+1.03	0.62
23-17-201	132.77	0.0	0.0	0.0	1.28	23-33-501	0.0	111.42	110.95	+0.47	0.79
23-17-202	129.49	142.17	142.42	0.25	1.56	23-33-601	101.40	107.54	106.45	+1.09	0.72
23-17-501	112.13	124.02	122.80	+1.22	1.52	23-33-801	94.17	101.71	99.55	+2.16	0.77
23-17-701	96.10	114.99	110.52	+4.47	2.06	23-34-101	106.83	115.65	113.79	+1.86	0.99
23-17-703	86.86	100.28	91.90	+8.38	0.60	23-34-402	0.0	115.80	114.55	+1.25	*
23-17-704	70.14	75.10	75.56	0.46	0.77	23-34-502	126.72	136.73	135.79	+0.94	2.58
23-17-705	0.0	83.31	81.85	+1.46	0.36	23-34-503	115.32	120.62	116.95	+3.67	0.23
23-17-706	83.22	100.95	100.40	+0.55	2.45	23-34-601	113.84	122.64	122.34	+0.30	1.21
23-17-801	75.13	0.0	85.38	0.13**	0.35	23-34-701	0.0	118.20	117.74	+0.46	*
23-17-802	54.34	68.62	70.05	1.43	2.24	23-34-801	128.92	144.73	143.45	+1.28	2.08
23-17-804	52.53	0.0	0.0	0.0	0.00	23-34-802	129.80	151.88	0.0	0.0	3.68
23-17-901	73.47	79.62	79.30	+0.32	0.96	23-34-803	127.80	135.84	0.0	0.0	1.34
23-18-201	128.97	152.40	152.95	0.55	3.43	23-34-804	125.00	142.42	140.96	+1.46	1.65
23-18-301	145.56	174.58	174.30	+0.28	4.11	23-34-902	121.93	130.80	130.55	+0.25	1.23
23-18-401	55.21	0.0	0.0	0.0	1.21	23-34-904	117.62	128.49	128.42	+0.07	1.54
23-18-402	112.27	134.03	133.55	+0.48	3.04	23-35-101	0.0	84.51	80.84	+3.67	*
23-18-403	113.12	124.35	125.15	0.80	1.72	23-35-301	0.0	116.88	116.42	+0.46	*
23-18-404	118.57	138.43	140.97	2.54	3.20	23-35-501	0.0	99.05	97.90	+1.15	2.73
23-18-502	0.0	122.20	121.52	+0.68	2.14	23-35-701	114.86	133.07	132.35	+0.72	3.58
23-18-601	118.81	136.80	139.65	2.85	3.86	23-35-703	116.67	131.54	130.50	+1.04	1.98
23-18-703	0.0	86.25	85.40	+0.85	*	23-35-802	104.86	115.04	114.56	+0.48	1.17
23-18-704	0.0	83.65	84.55	0.90	0.79	23-35-901	0.0	156.15	146.65	+9.50	*
23-19-301	149.11	184.47	186.03	1.56	5.27	23-36-401	0.0	106.30	105.43	+0.87	*



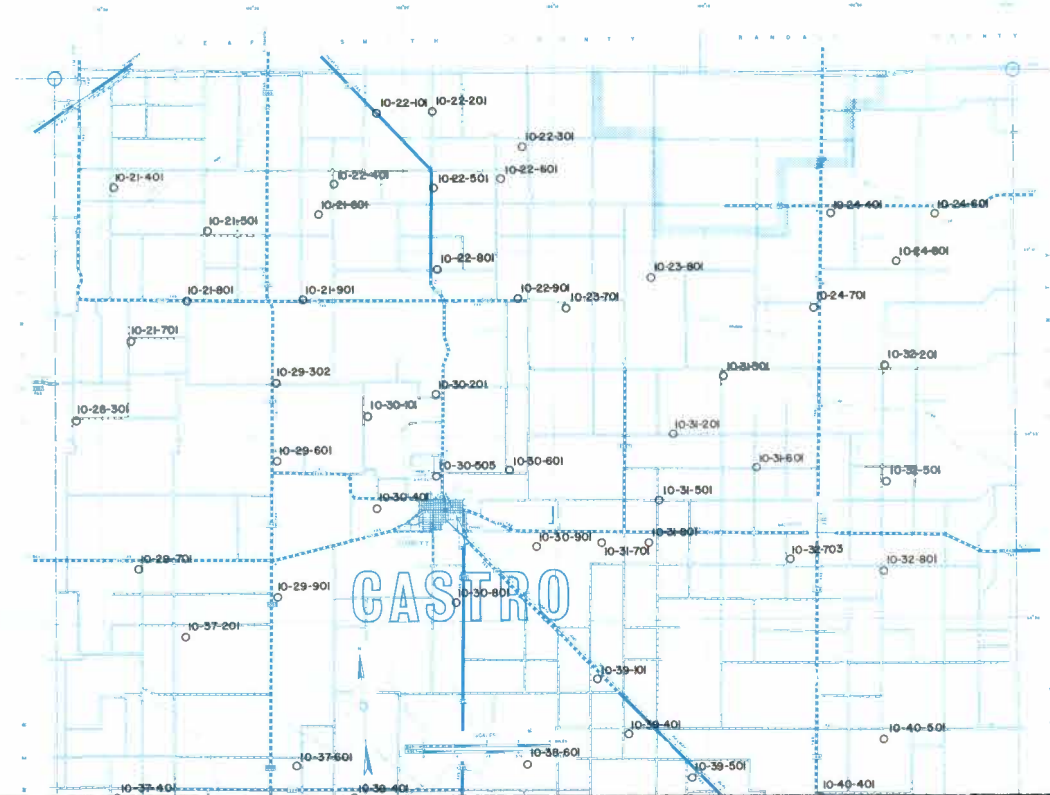
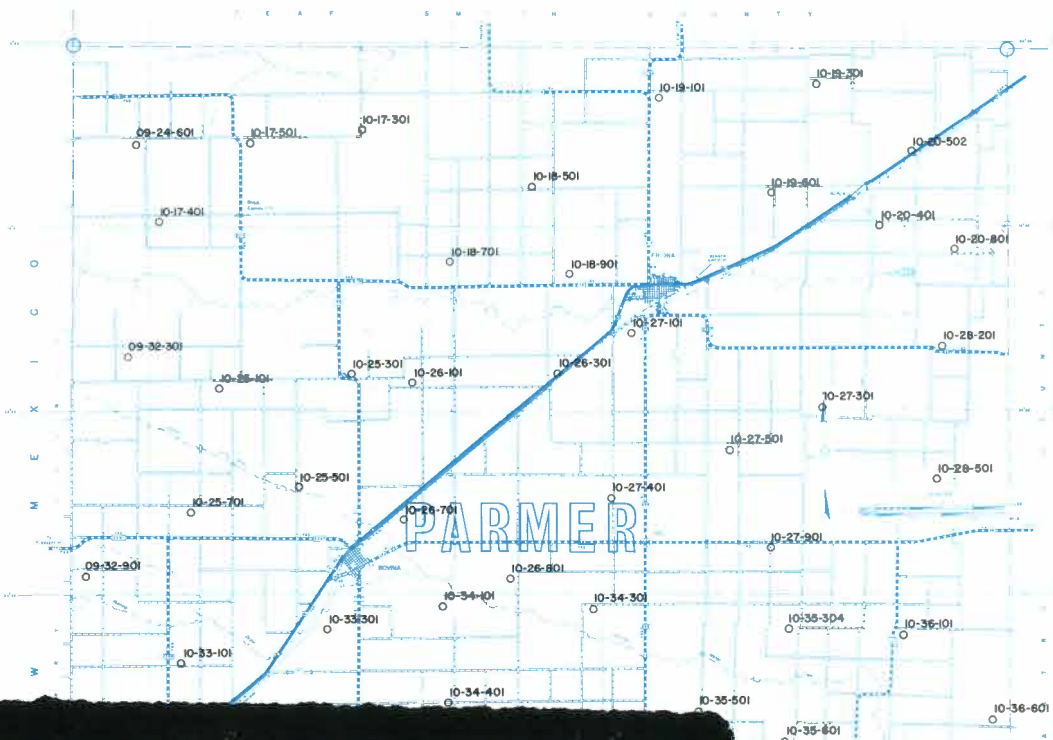


**RANDALL COUNTY**

Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
06-49-701	0.0	226.00	0.0	0.0	5.14
06-49-902	0.0	203.63	205.13	1.50	0.91
06-57-202	0.0	188.89	188.71	+0.18	2.53
06-57-401	152.36	0.0	170.82	2.18**	5.87
06-57-601	149.04	164.73	167.06	2.33	2.57
06-57-802	0.0	144.60	143.24	+1.36	2.75
07-55-901	0.0	186.41	187.16	0.75	6.45
07-56-701	165.89	197.90	200.70	2.80	4.97
07-56-702	187.97	0.0	0.0	0.0	1.55
07-56-902	0.0	185.79	0.0	0.0	3.29
07-63-301	0.0	203.57	0.0	0.0	8.25
07-63-601	123.30	140.55	146.23	5.68	3.28
07-63-902	0.0	121.35	125.79	4.44	3.38
07-64-101	0.0	198.76	0.0	0.0	8.64
07-64-302	139.64	151.36	152.28	0.92	3.40
07-64-402	0.0	105.11	108.20	3.09	1.35
07-64-501	0.0	135.07	135.40	0.33	0.51
07-64-903	132.64	143.49	155.80	12.31	*
10-07-301	0.0	126.14	123.26	+2.88	*
10-07-601	0.0	96.67	106.49	9.82	*
10-08-102	131.10	138.15	138.86	0.71	*
10-16-901	0.0	179.17	187.00	7.83	*
11-09-301	0.0	0.0	158.74	+0.17**	*
11-09-501	0.0	178.70	184.77	6.07	*
11-09-601	187.11	193.54	193.68	0.14	*
11-09-801	173.41	188.26	188.09	+0.17	*
11-09-901	166.44	185.19	186.10	0.91	*
11-10-201	0.0	0.0	0.0	0.0	*
11-10-402	169.48	170.84	171.41	0.57	*
11-10-802	0.0	172.43	173.99	1.56	*
11-11-101	0.0	131.43	0.0	0.0	*
11-11-502	0.0	161.05	160.58	+0.47	*
11-11-701	0.0	164.29	0.0	0.0	*
11-11-801	0.0	108.14	109.51	1.37	*
11-11-901	0.0	116.91	115.90	+1.01	*

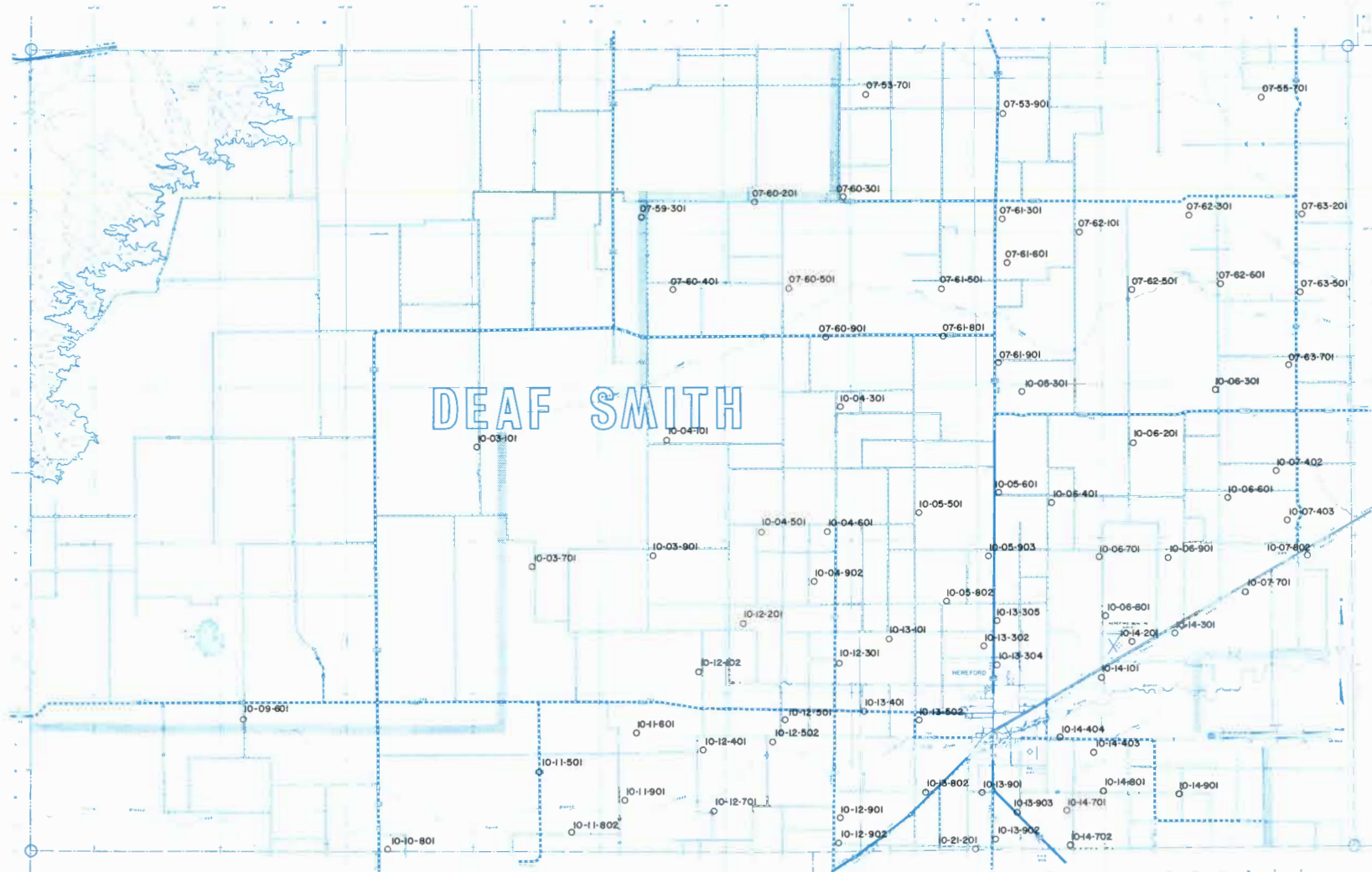
\*Data not available

\*\*Computed decline





# Water Level Measurements In Observation Wells In High Plains Water District



DEAF SMITH COUNTY

Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
07-53-701	204.53	224.55	224.17	+0.38	0.36
07-53-901	188.15	220.73	222.62	1.89	4.92
07-55-701	179.07	205.60	208.68	3.08	4.23
07-59-301	0.0	316.79	309.29	+7.50	2.89
07-60-201	0.0	278.29	279.52	1.23	3.13
07-60-301	226.40	248.68	251.78	3.10	3.63
07-60-401	0.0	288.02	287.07	+0.95	*
07-60-501	210.72	237.83	241.88	4.05	5.34

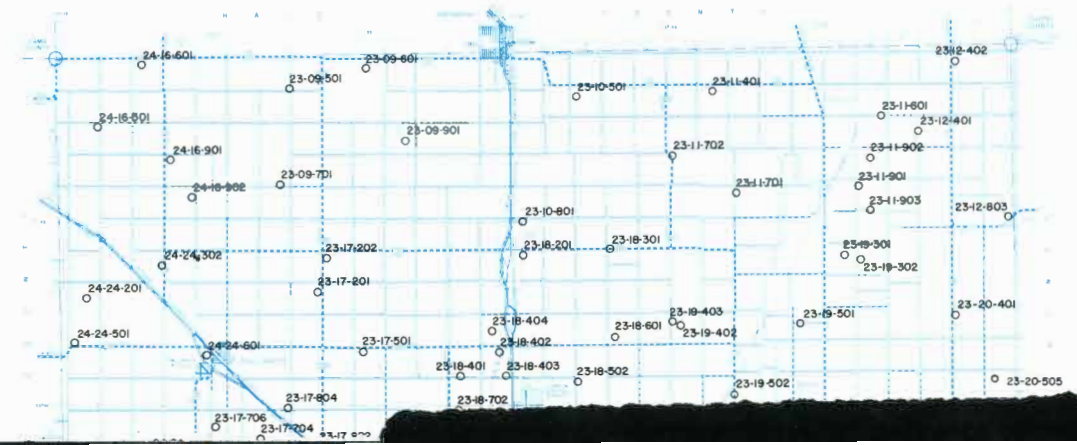
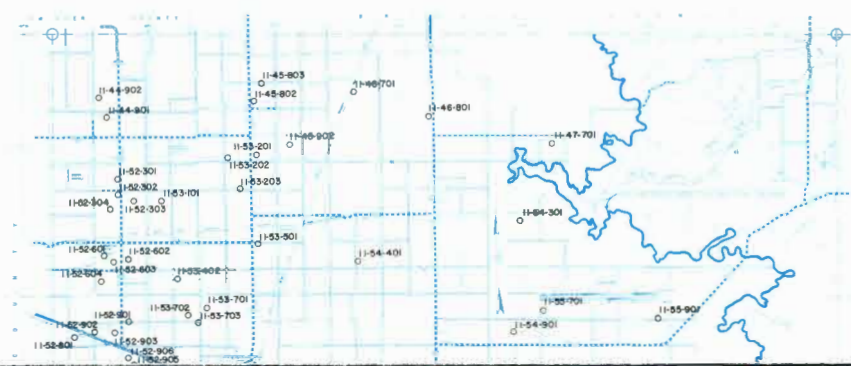
Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
07-60-901	0.0	204.75	204.22	+0.53	1.57
07-61-301	0.0	202.43	206.41	3.98	3.66
07-61-501	0.0	177.36	0.0	0.0	2.69
07-61-601	0.0	177.28	181.52	4.24	3.53
07-61-801	0.0	175.58	178.96	3.38	2.50
07-61-901	139.06	154.67	158.53	3.86	3.07
07-62-101	161.93	193.95	196.45	3.40	3.56
07-62-301	161.87	180.85	181.10	0.25	2.75

Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
07-62-501	134.40	149.80	150.77	0.97	2.71
07-62-601	133.97	173.14	172.80	+0.34	4.33
07-63-201	149.15	175.29	177.38	2.09	5.08
07-63-501	109.98	119.40	125.09	5.69	3.30
07-63-701	126.22	146.59	148.36	1.77	3.16
10-03-101	286.40	296.64	299.51	2.87	1.80
10-03-701	0.0	220.94	221.11	0.17	*
10-03-901	212.00	235.39	238.59	3.20	3.80

Well No.	Depth To Water 62	Depth To Water 68	Depth To Water 69	Decline 1968-1969	Average Decline Per Year
10-04-101	275.05	296.15	300.62	4.47	3.65
10-04-301	226.23	259.52	262.41	2.89	5.17
10-04-501	219.44	0.0	0.0	0.0	6.51
10-04-601	0.0	223.79	229.48	5.69	5.63
10-04-902	0.0	164.83	170.52	5.69	2.11
10-05-301	134.90	159.67	153.18	+6.49	2.61
10-05-501	135.27	175.17	186.32	11.15	7.29
10-05-601	0.0	137.13	141.04	3.91	4.00
10-05-802	118.43	143.13	142.59	+0.54	3.45
10-05-903	0.0	149.10	155.05	5.95	4.51
10-06-201	117.87	138.99	141.56	2.57	2.98
10-06-301	129.80	156.17	159.68	3.51	2.75
10-06-401	126.96	151.80	154.18	2.38	3.89
10-06-601	120.35	143.75	157.99	14.24	5.38
10-06-701	52.25	68.25	67.37	+0.88	2.19
10-06-801	66.14	87.46	80.99	+6.47	*
10-06-901	104.05	124.46	128.30	3.84	3.46
10-07-402	110.02	138.38	139.21	0.83	3.16
10-07-403	96.70	122.00	128.16	6.16	4.49
10-07-701	98.46	118.63	128.05	9.42	1.92
10-07-802	122.07	174.56	138.79	+35.77	2.32
10-09-601	64.98	58.06	57.11	+0.95	*
10-10-801	185.90	195.97	197.80	1.83	1.70
10-11-501	171.99	184.00	186.05	2.05	2.01
10-11-601	151.10	170.43	169.28	+1.15	2.50
10-11-802	0.0	188.09	192.38	4.29	4.30
10-11-901	0.0	160.30	163.29	2.99	2.69
10-12-102	136.70	159.33	154.24	+5.09	0.98
10-12-201	67.66	74.90	79.45	4.55	1.68
10-12-301	129.21	153.63	157.12	3.49	3.99
10-12-401	0.0	176.10	182.46	6.36	5.08
10-12-501	153.53	0.0	202.56	9.42*	3.79
10-12-502	112.37	140.90	0.0	0.0	4.76
10-12-701	120.23	142.98	152.95	9.97	5.14
10-12-901	112.21	142.50	141.57	+0.93	4.55
10-12-902	148.25	0.0	0.0	0.0	3.44
10-13-101	132.68	158.86	0.0	0.0	4.36
10-13-302	102.10	125.10	135.14	10.04	5.31
10-13-304	115.03	139.12	152.55	13.43	6.97
10-13-305	0.0	125.79	127.17	1.38	2.46
10-13-401	117.12	138.88	145.95	7.07	3.91
10-13-502	134.72	158.95	165.40	6.45	4.38
10-13-802	105.84	0.0	0.0	0.0	8.67
10-13-901	122.07	140.27	140.97	0.70	2.70
10-13-902	125.06	147.40	150.63	3.23	3.06
10-13-903	126.62	151.47	156.94	5.47	4.33
10-14-101	0.0	0.0	75.18	+4.34*	3.81
10-14-201	70.93	114.19	114.32	0.13	5.46
10-14-301	69.25	77.59	76.19	+1.40	0.41
10-14-403	93.69	114.93	115.61	0.68	3.13
10-14-404	0.0	114.55	121.73	7.18	7.18
10-14-701	139.55	166.75	168.20	1.45	4.09
10-14-702	139.05	166.36	154.10	+12.26	2.15
10-14-801	122.26	138.43	140.80	2.37	2.65
10-14-901	101.86	0.0	108.38	0.79*	1.28
10-21-201	148.60	186.00	182.63	+3.37	2.44

\*Data not available

\*\*Computed decline











A MONTHLY PUBLICATION OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1

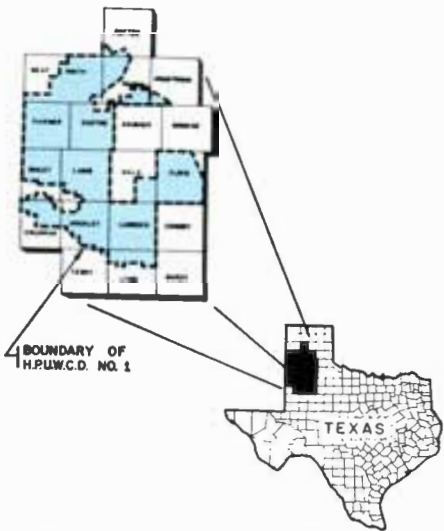
1628 15th Street, Lubbock, Texas 79401  
Telephone PO 2-0181

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- Tony Schertz ..... Draftsman
- Kenneth Seales ..... Field Representative
- Herb Spradlin ..... Field Representative
- Obbie Goolsby ..... Field Representative
- J. Dan Seale ..... Field Representative
- Ernestine Cox ..... Bookkeeper
- Doris Hagens ..... District Secretary
- Clifford Thompson ..... Secretary
- Jo Ann Bilbrey ..... Secretary



Election . . .

—continued from page 1

POLLING PLACES

- ARMSTRONG COUNTY  
Wayside Community House
- BAILEY COUNTY  
High Plains Water District Office,  
Muleshoe
- CASTRO COUNTY  
City Hall, Dimmitt
- COCHRAN COUNTY  
Western Abstract Co.,  
Morton, Texas
- CROSBY COUNTY  
Lorenzo Community Center,  
Lorenzo, Texas
- DEAF SMITH COUNTY  
2nd floor, County Court House,  
Hereford, Texas
- FLOYD COUNTY  
101 South Wall Street,  
Floydada, Texas
- HALE COUNTY  
1617 Main,  
Petersburg, Texas
- HOCKLEY COUNTY  
208 College,  
Levelland, Texas

- LAMB COUNTY  
620 Hall Ave.,  
Littlefield, Texas
  - LUBBOCK COUNTY  
1628 15th Street,  
Lubbock, Texas
  - LYNN COUNTY  
Wilson Co-op Gin
  - PARMER COUNTY  
Wilson and Brock Insurance Co.,  
Bovina, Texas
  - POTTER COUNTY  
County Clerk's Office,  
Amarillo, Texas
  - RANDALL COUNTY  
Randall County Farm Bureau Of-  
fice, Canyon, Texas
- Absentee balloting for the annexation election will begin April 2, and continue through April 18th. Absentee balloting will be conducted by the County Secretaries in the County Water District Offices except in Potter, Armstrong and Crosby Counties. Potter County residents may cast their absentee ballots at the County Clerk's Office. Armstrong County residents may cast their absentee ballots with John Patterson of Wayside. Crosby County voters may vote absentee at 107 Jackson, Lorenzo, Texas.

Water Statement . . .

—continued from page 1

January 1969 water-level data were performed by digital computer.

The decline (see the notation "Computed Decline" in the tables) shown for those wells wherein the water level was not measured in 1968 but was measured in 1969, and some previous year (1962, 63, 64, 65, 66 or 67) was computed by subtracting the next previous water - level measurement from the 1969 measurement; and dividing this difference by the number of intervening years between measurements.

CHANGE 1968-1969

The difference or change in the depth to water in each well, from January 1968 to January 1969, is



Reading feet of wetted tape.

listed in the tables as "Decline 1968-1969". These values represent the difference of the 1968 depth to water subtracted from the 1969 depth to water. If this difference is a positive value — the 1969 depth to water was less than the 1968 depth to water — a rise in water level, a plus sign (+) precedes the value of the change.

AVERAGE DECLINE

The average decline (or rise) per year of the water level as measured in each well is also listed in the tables on page 2 through 7. These values were determined by subtracting each year's water-level measurement from the next proceeding year's measurement; algebraically adding the values thus determined; and dividing this sum by the number of individual-year decline or rise values considered. This method of averaging would, in most cases, avoid the large errors inherent in using only two water-level measurement records — such as subtracting the January 1962 measurement from the January 1969 measurement, then dividing by seven (the number of years between measurements) — in the event one or both such measurements are invalid.

The average decline values can, in most cases, be used as a guide in determining the validity of the 1968, 1969 changes in water levels.

No. 00

No. 00

APRIL 22, 1969

SAMPLE  
BALLOT

Election for Annexation to High Plains  
Underground Water Conservation  
District No. 1  
COUNTY

NOTE: Voter's Signature to be Affixed  
on the Reverse Side.

Place an "X" in the square beside the statement, indicating the way you wish to vote.

- FOR The confirmation of the annexation of certain eligible lands in Commissioner's Precinct 3 of Crosby County to the High Plains Underground Water Conservation District No. 1.
- AGAINST

---

- FOR The assumption by certain eligible lands in Commissioner's Precinct 3 of Crosby County of its pro rata share of all indebtedness, if any and/or maintenance taxes that may be owed, contracted or authorized by or for the High Plains Underground Water Conservation District No. 1.
- AGAINST



# THE Cross SECTION

A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 15—No. 11

"THERE IS NO SUBSTITUTE FOR WATER"

April, 1969

Then



Now

**Then.** Old water wagon used in the early 1900's to transport drinking water. **Now.** San Luis Canal in California.

This canal is much like the proposed canal in the Texas Water Plan.

The people of California have risen to the cause and are transporting water from areas of plenty to the areas of need.

The people of Texas and more especially the people of West Texas must take a look at what has been done in California and see what can be done in Texas if the people are determined.

We must realize that our supply of groundwater is limited and see the necessity for finding a supplementary supply.

A dynamic Water Plan has been proposed that has been determined to be engineering and economically feasible. The only problems that can be seen on the horizon are "people problems."

We are not discussing the economy of a few people in a given location but we are discussing the economy of the entire nation. The ability of our country to feed it's people in the years to come is largely dependent upon getting our surplus water to the rich agricultural areas of our Nation.





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**District Office Lubbock**

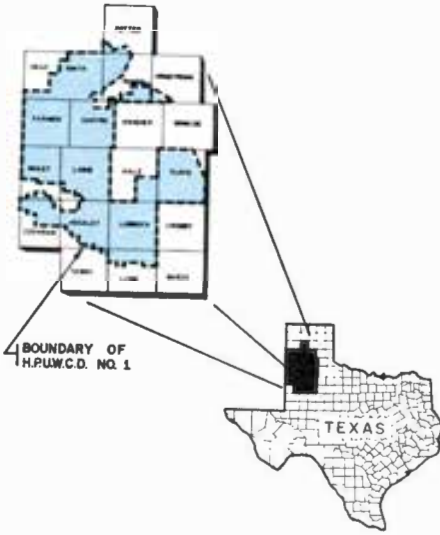
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**BOARD OF DIRECTORS**

- Precinct 1**  
(LUBBOCK and LYNN COUNTIES)  
Russell Bean, President ..... 2301 21st St., Lubbock
- Precinct 2**  
(COCHRAN, HOCKLEY and LAMB COUNTIES)  
Weldon Newsom, Secretary-Treasurer ..... Morton
- Precinct 3**  
(BAILEY, CASTRO and FARMER COUNTIES)  
Ross Goodwin ..... Muleshoe
- Precinct 4**  
(ARMSTRONG, DEAF SMITH, POTTER and RANDALL COUNTIES)  
John Pitman ..... Hereford
- Precinct 5**  
(FLOYD and HALE COUNTIES)  
Chester Mitchell, Vice-President ..... Lockney

**COUNTY COMITTEEMEN**

- Armstrong County**  
John Patterson, 1971 ..... Wayside  
Foster Parker, 1970 ..... Rt. 1, Happy  
Guy Watson, 1971 ..... Wayside  
James Bible, 1970 ..... Wayside  
Carroll Rogers, 1972 ..... Wayside
- Bailey County**  
Darlene Henry  
High Plains Water District  
Box 563, Muleshoe  
Lloyd Throckmorton, 1971 ..... Box 115, Muleshoe  
Ernest Ramm, 1970 ..... Rt. 2, Muleshoe  
W. L. Welch, 1970 ..... Star Rt., Maple  
R. L. Davis, 1971 ..... Box 61, Maple  
Jessie Ray Carter, 1972 ..... Rt. 5, Muleshoe  
Committee meets last Friday of each month at 2:30 p.m., 217 Avenue B, Muleshoe, Texas.
- Castro County**  
E. B. Noble  
City Hall, Dimmitt, Texas  
Dale Maxwell, 1970 ..... Hiway 385, Dimmitt  
Frank Wise, 1970 ..... 716 W. Grant, Dimmitt  
Donald Wright, 1971 ..... Box 65, Dimmitt  
Morgan Dennis, 1971 ..... Star Rt., Hereford  
John Gilbreath, 1972 ..... Rt. 2, Hart  
Committee meets on the last Saturday of each month at 10:00 a.m., City Hall, Dimmitt, Texas.
- Cochran County**  
W. M. Butler Jr.  
Western Abstract Co., Morton, Texas  
Ronald Coleman, 1971 ..... Rt. 1, Morton  
D. A. Ramsey, 1970 ..... Star Rt. 2, Morton  
Hugh Hansen, 1970 ..... Rt. 2, Morton  
Don Keith, 1971 ..... Rt. 1, Morton  
Keith Kennedy, 1972 ..... Star Rt. 2, Morton  
Committee meets on the second Wednesday of each month at 8:00 p.m., Western Abstract Co., Morton, Texas.
- Deaf Smith County**  
B. F. Cain, 2nd Floor  
County Court House, Hereford, Texas  
Billy Wayne Slisson, 1971 ..... Rt. 5, Hereford  
Frank Zinser, 1970 ..... Rt. 5, Hereford  
L. B. Wortham, 1970 ..... Rt. 3, Hereford  
Harry Fuqua, 1971 ..... Rt. 1, Hereford  
W. L. Davis, Jr., 1972 ..... Hereford  
Committee meets the first Monday of each month at 7:30 p.m., High Plains Water District office, Hereford, Texas.
- Floyd County**  
Gayle Baucum  
101 South Wall Street, Floydada, Texas  
Pat Frizzell, 1970 ..... Box 1046, Lockney  
Tate Jones, 1970 ..... Rt. 4, Floydada  
M. M. Julian, 1971 ..... Box 65, South Plains  
J. McNeill, 1971 ..... 833 W. Tenn., Floydada  
Jan Jarboe, 1972 ..... Rt. 4, Floydada  
Committee meets on the first Tuesday of each month at 10:00 a.m., Farm Bureau Office, Floydada.



- Hale County**  
J. B. Mayo  
1617 Main, Petersburg, Texas  
Charles Schuler, 1970 ..... Petersburg  
Don Hegl, 1970 ..... Box 160 A, Petersburg  
Harold D. Rhodes, 1971 ..... Box 100, Petersburg  
J. C. Alford, 1971 ..... Box 28, Petersburg  
W. D. Scarborough, Jr., 1972 ..... Petersburg  
Committee meets first Monday each month at Water District office in Petersburg.

- Hockley County**  
Murray C. Stewart  
208 College, Levelland, Texas  
Ewel Exum, 1971 ..... Rt. 1, Ropesville  
J. E. Wade, 1970 ..... Rt. 2, Littlefield  
Jimmy Price, 1970 ..... Rt. 3, Levelland  
H. R. Phillips, 1971 ..... Rt. 4, Levelland  
Bryan Daniel, 1972 ..... N. Sherman, Levelland  
Committee meets first and third Fridays of each month at 1:30 p.m., 917 Austin St., Levelland, Texas.

- Lamb County**  
Calvin Price  
620 Hall Avenue, Littlefield, Texas  
Gene Templeton, 1971 ..... Star Rt. 1, Earth  
Jack Thomas, 1970 ..... Box 13, Olton  
Lee Roy Fisher, 1970 ..... Box 344, Sudan  
Artis Barton, 1971 ..... Hiway 70, Earth  
W. W. Thompson, 1972 ..... Spade  
Committee meets the first Thursday of each month at 8:00 p.m., Crescent House Restaurant, Littlefield.

- Lubbock County**  
Doris Hagens  
1628 15th Street, Lubbock, Texas  
Glenn Blackmon, 1971 ..... Rt. 1, Shallowater  
R. F. (Bob) Cook, 1970 ..... 804 6th St., Idalou  
Bill Dorman, 1970 ..... 1910 Ave. E, Lubbock  
Andrew (Buddy) Turnbow, 1971 ..... Rt. 5, Lubbock  
Alex Bednarz, 1972 ..... Rt. 1, Slaton  
Committee meets on the first and third Mondays of each month at 1:30 p.m., 1628 15th St., Lubbock, Texas.

- Lynn County**  
Doris Hagens  
1628 15th Street, Lubbock, Texas  
Roy Lynn Kahlich, 1970 ..... Wilson  
Roger Blakney, 1970 ..... Rt. 1, Wilson  
Reuben Sander, 1971 ..... Rt. 1, Slaton  
O. R. Phifer, Jr., 1971 ..... New Home  
Dale Zant, 1972 ..... Rt. 1, Wilson  
Committee meets the third Tuesday of each month at 10:00 a.m., 1628 15th Street, Lubbock, Texas.

- Farmer County**  
Aubrey Brock  
Wilson & Brock Insurance Co., Bovina, Texas  
Guy Latta, 1971 ..... Friona  
Henry Ivy, 1970 ..... Rt. 1, Friona  
Jim Ray Daniel, 1970 ..... Friona  
Edwin Lide, 1971 ..... Rt. D, Bovina  
Webb Gober, 1972 ..... RFD, Farwell  
Committee meets on the first Thursday of each month at 8:00 p.m., Wilson & Brock Insurance Agency, Bovina, Texas.

- Potter County**  
Fritz Meneke, 1970 ..... Rt. 1, Box 538, Amarillo  
Jim Line, 1971 ..... Bushland  
Vic Plunk, 1970 ..... Rt. 1, Amarillo  
Temple Rodgers, 1971 ..... Rt. 1, Amarillo  
F. G. Collard, 1972 ..... Rt. 1, Amarillo

- Randall County**  
Louise Knox  
Randall County Farm Bureau Office, Canyon  
R. B. Gist, Jr., 1971 ..... Rt. 3, Box 43, Canyon  
Carl Hartman, Jr., 1971 ..... Rt. 1, Canyon  
Marshall Rockwell, 1970 ..... Canyon  
Richard Friemel, 1970 ..... Rt. 1, Canyon  
Leonard Batehorst, 1972 ..... Rt. 1, Canyon  
Committee meets on the first Monday of each month at 8:00 p.m., 1710 5th Ave., Canyon, Texas.

**WATER DIVERSION a la Frangaise**



By **GEORGE A. WHETSTONE**  
Professor of Civil Engineering,  
Texas Tech

Provence, a portion of France's Mediterranean coast, has a climate much like that of the High Plains of Texas. Rains are infrequent. And the *mistral*; it's as chilling as its counterpart — a norther in the Panhandle.

Like the High Plains, Provence has a perennial water shortage. The minor streams flowing to the Mediterranean, though being developed by a sound program of channel realignment and storage dams, offer only moderate supplies. Ground water has been developed to, and in some localities beyond, its optimum yield and salt water encroachment is becoming increasingly troublesome.

Water needs continue to mount. Marseille, with a population of 773,000 in the 1962 census, is expected to double by 1966.

The agricultural pattern in Provence has consisted of irrigated river bottoms of very limited extent covered with orchards and truck gardens, of side slopes featuring vineyards and cereals, and of extensive uplands providing a precarious pasturage for sheep and goats. Urbanization has encroached upon the bottom lands at the same time that the needs for food and fibers have intensified.

A solution was apparent in that there was surplus water in the Durance River, a tributary of the Rhone which rises in the Alps along the French-Italian border. The flow of this river, however, has been very erratic — dropping below 1600 cubic feet per second most summers and rising in the greatest flood recorded to over 200,000 cfs. Sixteen canals are equipped to divert 4000 cfs for the irrigation of 183,000 acres, primarily in the valley of the lower Durance itself, and for an inadequate supply of Marseille under a grant made in 1838.

Additional water for Marseille and its environs could be obtained only by building dams which would guarantee full satisfaction of the existing rights as well as providing the supply desired. Test drillings at potential dam sites on the Durance, the earliest more than a century ago, revealed that serious difficulties would be encountered in providing foundations on some 350 feet of porous alluvium and gravel under the river bed.

Basing the design on American

**AMENDMENT H.J.R. 9 UP TO VOTERS**

The constitutional amendment H.J.R. 9 provides for the authorization of \$3.5 billion of bonds for the Water Development Board fund to begin implementation of the Texas Water Plan. The amendment passed both Houses of the legislature and has received the signature of Governor Preston Smith. The amendment will be submitted to the voters of Texas at a special election August 5, 1969.

**ANALYSIS OF H.J.R. 9**

H.J.R. 9 proposes a constitutional amendment for submission to the voters of Texas that will enable the State, in partnership with local and federal participants, to meet critical water resource needs through the year 2020.

H.J.R. 9 authorizes an increase in the Texas Water Development Fund by \$3,500,000,000, the major portion of which will be used to finance the municipal and industrial water supply segment of the Texas Water System, with remaining portions dedicated to continuation of existing Loan Assistance and Facility Acquisitions Programs, together with contingencies.

H.J.R. 9 delegates to the Legislature the duty of continuing supervision over the Water Development Program by requiring two-thirds (2/3) vote of both Houses before Development Bonds can be issued. On two past occasions, the Texas Legislature has, by two-thirds (2/3) vote of both houses, authorized separate increments of \$100,000,000.00 in Development Bonds, of which only \$100,000,000.00 have been issued.

H.J.R. 9 recognizes and preserves the "50 Year Limitation" of Article III, Section 49-d. The "50 Year Limitation," as proposed by the 59th Legislature, provides: "The Texas Water Development Fund or any other State fund provided for water development, transmission, transfer or filtration shall not be used to finance any project which contemplates as results in the removal from the basin of origin of any surface water necessary to supply the reasonably foreseeable future water requirements for the next ensuing fifty-year period within the river basin of origin, except on a temporary, interim basis." H.J.R. 9 specifically provides that the Texas Water Development Fund shall be used for the purposes heretofore permitted by and subject to the limitation in Article III, Sections 49c and 49d, including the "50-Year Limitation."

H.J.R. 9 eliminates the present 4% interest ceiling on Water Development Bonds, and provides that the Legislature shall prescribe the maximum interest.

H.J.R. 9 would authorize the Water Development Board to contract with a variety of governmental entities for the acquisition and development of water resources, but any general



# DISTRICT HOLDS COUNTY MEETINGS

The High Plains Underground Water Conservation District No. 1 has been conducting the annual meetings of the County Committees, County Secretaries and the member of the Board of Directors in his District Precinct.

The County Committees and Board of Directors are the backbone of the organization and have been given credit for the success of the District. The committeemen are responsible for approving well permits and have been instrumental in seeing many conservation practices were put to use. The Water District has been very fortunate to have had such dedicated men on the County Committees and on the Board of Directors.



HALE COUNTY



HALE COUNTY



LAMB COUNTY



CASTRO COUNTY



LAMB COUNTY



CASTRO COUNTY



CASTRO COUNTY



PARMER COUNTY



FLOYD COUNTY

## Precinct No. 3 Joins District

Residents of Commissioner's Precinct No. 3 of Crosby County voted to join the Water District in a confirmation of annexation election held on Tuesday the 22 of April.

The District is happy to welcome the new members into the District and will begin immediately to include them in all of the Districts programs.

The first five men County Committee will soon be appointed by the District Board of Directors. The county committee will then be elected during the Annual District Election in January. Each man will serve three year terms and the terms will be staggered. The area that was annexed is that land that is West of, or above the escarpment. This is the boundry of the groundwater resivor subdivision set up by the Texas Water Rights Commission.

## Amendment . . .

—continued from page 2

obligation debt so incurred will reduce by like amount the total authorization of Texas Water Development Bonds.

If H.J.R. 9 is adopted, the following concepts with respect to implementation of the Texas Water Plan are vitally important:

1) Adoption of H.J.R. 9 will put Texas in a stronger position for soliciting federal assistance, since the Legislature and citizens of the state will have expressed readiness to provide financing for their proportionate share of cost in implementing the Texas Water Plan.

2) Vested water rights are protected under the Texas Water Plan.

3) The issuance of bonds will be over a 50-year period, in increments as needed.

4) No bonds are expected to be issued before 1975 for construction of the Texas Water System.

5) No bond proceeds will be used for construction of the Proposed Texas Water System conveyance facility until Texas has assurance that out-of-state water imports are available.

The importance of this amendment cannot be over-emphasized. If the amendment does not receive a majority vote the Texas Water Plan will never become a reality.

**Water Is Your Future, Conserve It!**



## Water Law Conference

The University of Texas at Austin School of Law and the Center for Research in Water Resources and co-sponsoring a Water Law Conference on May 22 and 23, 1969 to be held here at the Law School Auditorium in Austin. The registration fee is \$65.00, which includes the reception and a copy of the conference proceedings.

### THURSDAY MORNING, MAY 22:

**Presiding:** Elbert Hooper, Hooper & Robinson, Austin Legal Counsel, Texas Water Pollution Control Board

8:00 Late Registration

9:00 Welcoming Remarks—Dean Page Keeton

Dr. Norman Hackerman, President,  
The University of Texas at Austin

Dr. Earnest F. Gloyna, Director, Center for  
Research in Water Resources

9:10 THE ROLE OF THE PRIVATE CITIZEN IN WATER RESOURCES PLANNING  
Professor Joseph L. Sax

9:50 Question and Answer Period

10:10 Coffee Break

10:30 THE TEXAS WATER PLAN: ISSUES AND ATTITUDES  
Professor Comer Clay

11:10 Question and Answer Period

11:30 FLOOD PLAIN MANAGEMENT  
Professor Earl B. Shurtz

12:10 Question and Answer Period

12:30 Lunch Break

### AFTERNOON:

**Presiding:** George D. Byfield, McGinnis, Lochridge, Kilgore, Byfield, Hunter & Wilson, Austin

2:00 NEW SMALL LAKE LAW  
Professor Ralph W. Johnson

2:40 Question and Answer Period

3:00 REGIONAL WATER QUALITY MANAGEMENT AND CONTROL  
Professor Corwin W. Johnson

3:40 Coffee Break

4:00 Question and Answer Period

4:20 PRO-RATING SHORTAGES COMPARED WITH PRIOR APPROPRIATION  
Professor Willis H. Ellis

5:00 Question and Answer Period

5:20 Adjourn

7:00 Reception

### FRIDAY MORNING, MAY 23:

**Presiding:** Bill Waddle, General Manager, Texas Water Association, Austin

9:00 MUNICIPAL PREFERENCE STATUTES  
Professor Robert W. Swenson

9:40 Question and Answer Period

10:00 RELATIONSHIPS BETWEEN WATER QUALITY AND WATER RIGHTS  
George B. Maul

10:40 Coffee Break

11:00 Question and Answer Period

11:20 COMPARATIVE WATER LAW OF SELECTED NATIONS  
Dean Frank J. Trelease

12:00 Question and Answer Period

12:20 Lunch Break

### AFTERNOON:

**Presiding:** Howard V. Rose, Brown, Erwin, Maroney & Barber, Austin, Chairman, Texas Water Quality Board

2:00 A MODEL WATER USE ACT FOR A RIPARIAN STATE — THE FLORIDA EXPERIENCE  
Dean Frank E. Maloney

2:40 Question and Answer Period

3:00 REGULATING GROUND WATER IN HUMID ZONES  
Professor Earl Finbar Murphy

3:40 Coffee Break

4:00 Question and Answer Period

4:20 Adjourn

## Water Diversion . . .

—continued from page 2

experience in earth dam construction, however, Serre-Poncon dam, rising 400 feet above the river bed, with a bottom width of 2170 feet and a crest length of 2000 feet, was completed in 1960. The resulting reservoir provides a live storage of 74,000 acre-feet, about thirty per cent of the mean annual flow. Several smaller dams have also been built in this development program.

Diversion of 745 cfs on an annual basis, with a peak rate of 1235 cfs in July, was then undertaken by tapping a tributary of the Durance, the Verdon, at an elevation of 1180 feet. (For comparison, the Canadian River Aqueduct is designed for a maximum flow of 80 cfs.) A tunnel 19.7 feet in diameter and 3.6 miles long carries the water through the ridge which constitutes the watershed boundary. From here the *Canal de Provence*, some places in pressure pipe, some places in open channel depending on surface slope and on right-of-way considerations carries irrigation, municipal and industrial water on a network of branching canals aggregating about 90 miles which, in turn, supply 1800 miles of pressure pipe. These latter are designed to provide sprinkler irrigation on some 148,000 acres.

In some particulars the problem of Provence does not parallel that of the High Plains too closely. Water was

available in an adjacent basin without necessitating pump lifts; on the contrary, power revenues could be added to charges for domestic and industrial supplies for France's second largest city to subsidize irrigation. Pipe- and canal-sizes and distances involved were moderate.

There are, however, lessons for the High Plains in Provence's success.

1. All interested parties participated in the creation of a water district consisting of the city of Marseille and the *departements* of Bouches-des-Rhone and Var, to which they deeded earlier water rights. The region then presented a united front in seeking a solution adequate for all.

2. Detailed studies of water needs for the best crops of each particular subregion and of municipal and industrial uses permitted rational design of efficient facilities.

3. Multiple-purpose development—irrigation, domestic and industrial supply, power, flood control, and salinity control — was stressed, and the design of all facilities was such that wastage of water was minimized by controlling headgates by telecommand actuated by downstream water levels.

4. Interference with routes of transportation, and much expensive condemnation for right-of-way was avoided by judicious mixing of buried pressure conduits and open channels. Pressure pipe and sprinkler irrigation were employed to conserve water and land.

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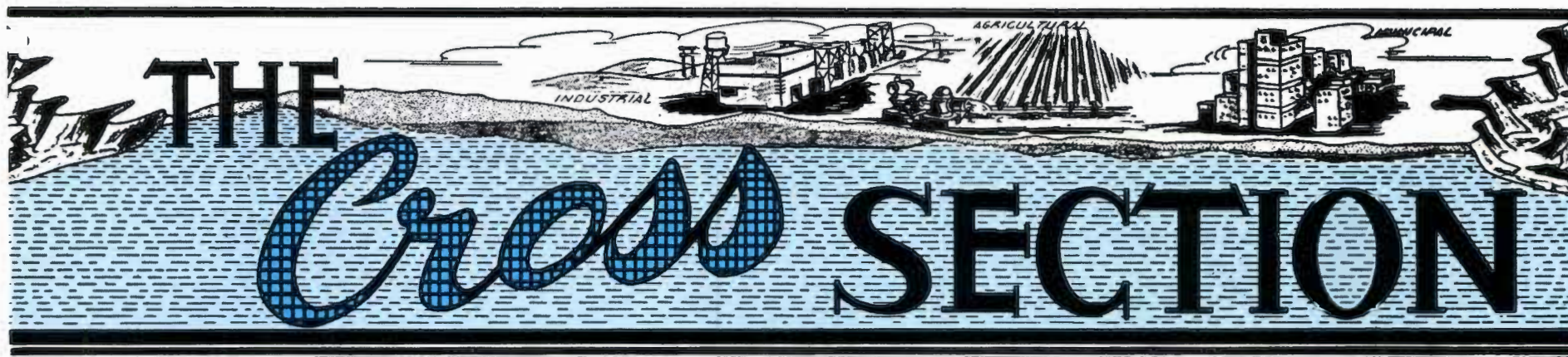
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A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 15 — No. 12

"THERE IS NO SUBSTITUTE FOR WATER"

May, 1969

## NEAL ON WATER COMMISSION

Leslie R. Neal was appointed by Governor Preston Smith to the Texas Water Right's Commission on March 6, 1969.

He will join Joe D. Carter of Sherman and Otha Dent of Littlefield in undertaking the massive job of determining and protecting the water rights of the State of Texas.

A close personal friend of the governor, Neal is a member of the State Democratic Executive Committee. He retired in 1967 as president of Leslie Neal and Sons, Inc. A native San Antonio man, Neal was in hardware, implement, and automobile businesses before becoming a petroleum distributor in 1932.

Confirmation of the appointment automatically cancelled Neal's tenure as chairman of the San Antonio River Authority.

Neal has a long list of business and civic honors. He is a former president and director of San Antonio's Chamber of Commerce, was twice president of Texas Oil Jobber's Association, served on the general committee of the Marketing division of American Petroleum Institute and has served twice as president. He served once as vice-president and was a member of the Board of Directors of Main Bank and Trust in San Antonio.

## DISTRICT PERSONNEL PRESENTS PAPER

Mr. Tom McFarland, General Manager, and Frank Rayner, Chief Engineer, for the Water District were the guests of the University of California at Berkeley to attend a symposium.

Mr. McFarland and Mr. Rayner presented papers entitled "Ground Water Basin Management Under the Private Ownership Concept" a Texas case study.

## The Future of Texas Depends On Amendment No. 2

Governor Preston Smith has recently selected the members of a statewide committee to help inform Texans of the benefits involved in making an adequate State loan fund available for the new Texas Water Plan.

It is the Governor's feeling that the future of Texas' economy is so dependent upon the passage of Constitutional Amendment No. 2 until every citizen should be equipped with an informed, self interest as to what the cost to him and his future generations might be should the Amendment fail.

*Constitutional Amendment No. 2* proposes a constitutional amendment for submission to the voters of Texas that will enable the State, in partnership with local and federal participants, to meet critical water resource needs through the year 2020.

*Constitutional Amendment No. 2* authorizes an increase in the Texas Water Development Fund by \$3,500,000,000, the major portion of which will be used to finance the municipal and industrial water supply segment of the Texas Water System, with remaining portions dedicated to continuation of existing Loan Assistance and Facility Acquisitions Programs, together with contingencies.

*Constitutional Amendment No. 2* delegates to the Legislature the duty of continuing supervision over the Water Development Program by requiring two-thirds (2/3) vote of both Houses before Development Bonds can be issued. On two past occasions, the Texas Legislature has, by two-thirds (2/3) vote of both houses, authorized separate increments of \$100,000,000.00 in Development Bonds, of which only \$100,000,000.00 have been issued.

*Constitutional Amendment No. 2* rec-

ognizes and preserves the "50 Year Limitation" of Article III, Section 49-d. The "50-Year Limitation," as proposed by the 59th Legislature, provides: "The Texas Water Development Fund or any other State fund provided for water development, transmission, transfer or filtration shall not be used to finance any project which contemplates as results in the removal from the basin of origin of any surface water necessary to supply the reasonably foreseeable future water requirements for the next ensuing fifty-year period within the river basin of origin, except on a temporary, interim basis."

*Constitutional Amendment No. 2* specifically provides that the Texas Water Development Fund shall be used for the purposes heretofore permitted by and subject to the limitation in Article III, Sections 49c and 49d, including the "50-Year Limitation."

*Constitutional Amendment No. 2* eliminates the present 4% interest ceiling on Water Development Bonds, and provides that the Legislature shall prescribe the maximum interest.

*Constitutional Amendment No. 2* would authorize the Water Development Board to contract with a variety of governmental entities for the acquisition and development of water resources, but any general obligation debt so incurred will reduce by like amount the total authorization of Texas Water Development Bonds.

*Constitutional Amendment No. 2* is adopted, the following concepts with respect to implementation of the Texas Water Plan are vitally important:

1) *Adoption of Constitutional*

—continued on page 4

## SUN vs. WHITAKER

On April 30, 1969, Judge M. C. Ledbetter entered a Judgment in the case of Sun Oil Company vs. Whitaker. Readers of the *Cross-Section* will recall that suit was originally brought by Sun Oil Company against Mr. Earnest Whitaker seeking an injunction to prevent Mr. Whitaker from interfering with Sun Oil Company's use of underground water from the Ogallala Formation for secondary recovery operations. The Judgment entered by Judge Ledbetter, after a jury trial was held, denied the injunction sought by Sun Oil Company. The injunction sought by Mr. Whitaker against Sun Oil Company seeking to prevent the oil company's use of Ogallala water for secondary recovery operations was granted. Judgment was also entered in favor of Mr. Whitaker against Sun Oil Company for damages in the amount of \$12,598.03; court costs were adjudged against Sun Oil Company. The Judgment also recited that Sun Oil Company expected and gave notice that it would appeal the Judgment entered in this case.

## T.E.A. MEETS IN LUBBOCK

Tom McFarland, General Manager of the Water District, was recently elected vice-chairman of the Advisory Committee on Conservation Education of the Texas Educational Agency at the spring meeting in Lubbock.

This Committee is influential in determining the curriculum of the Texas Schools. They are working to get some basic conservation education courses taught in the Texas Schools. Texas is one of the few states that does

—continued on page 4



# Deaf Smith County Conservation

Deaf Smith County and the Hereford area has been one of the fastest growing areas of the state. Water has been the determining factor of this growth and prosperity. Many of the farmers of the area have been making full use of their water by using tailwater recirculation pits and pumping water from playa lakes.

Mr. Charles Schlabs, who farms four miles south of Hereford, has recently engineered and constructed one of the most elaborate tailwater recirculation pits in the area.



The centrifugal pump and the silt suspension return flow pipe layout in the Schlabs tailwater return pit. The square pattern of the silt suspension pipes can be seen in this photograph. These are 2-inch plastic pipes with 1/4-inch holes, four feet on centers, drilled in the top.



Mr. Charles Schlabs, owner and operator standing before the automatic and manual control facilities of his elaborate tailwater recirculation system.



The screened structure in the center of the Schlabs pit (right center of this photograph) surrounds the inlet pipe to the pit. The stake to the left of the screened inlet is a staff gage from which the depth of the water in the pit can be read. The centrifugal pump is controlled by a switch that in turn is activated by the depth of the water in the pit.

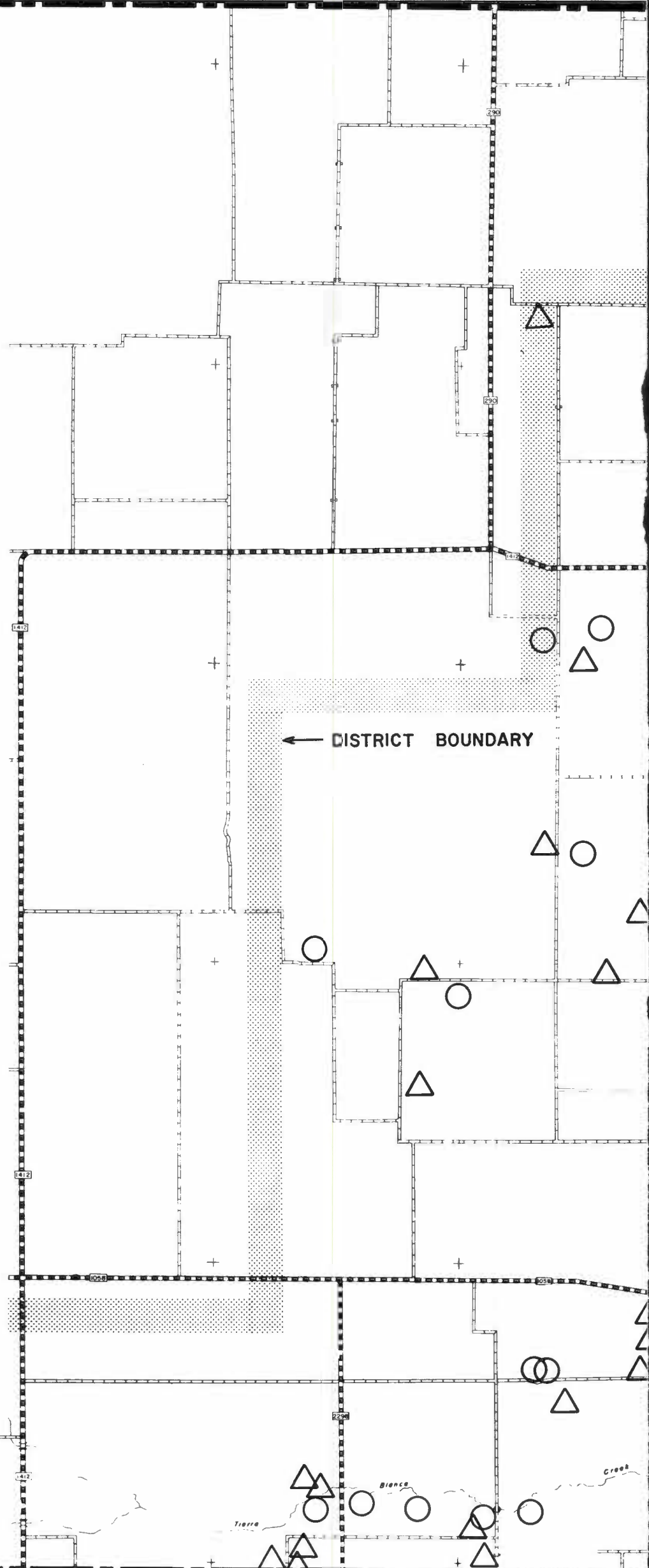
Deaf Smith County has 187 tailwater recirculation systems and 92 playa lake installations. Each year, over 9,200 acre feet of playa lake water has been utilized at an estimated value of \$368,000. Over 104,720 tons of silt has been kept on the land annually by the use of tailwater installations and 14,960 acre feet of tailwater has been saved at an estimated value of \$598,400. The return of minerals to the soil also shows impressive statistics. Approximately 448,800 pounds of nitrogen at an estimated value of \$27,924; 2,076,400 pounds of calcium and 2,812,480 pounds of magnesium are returned to the soil annually.

The experimental tailwater installations have proven the following advantages for the High Plains farmers:

—continued on page 4



Control facilities, motor and centrifugal pump and valves used to regulate flow through the silt suspension return flow pipes (eight in number) pump and control facilities are located atop a 2-ft by 20-ft. wide berm that surrounds the 180-ft by 180-ft by 12-ft deep pit.

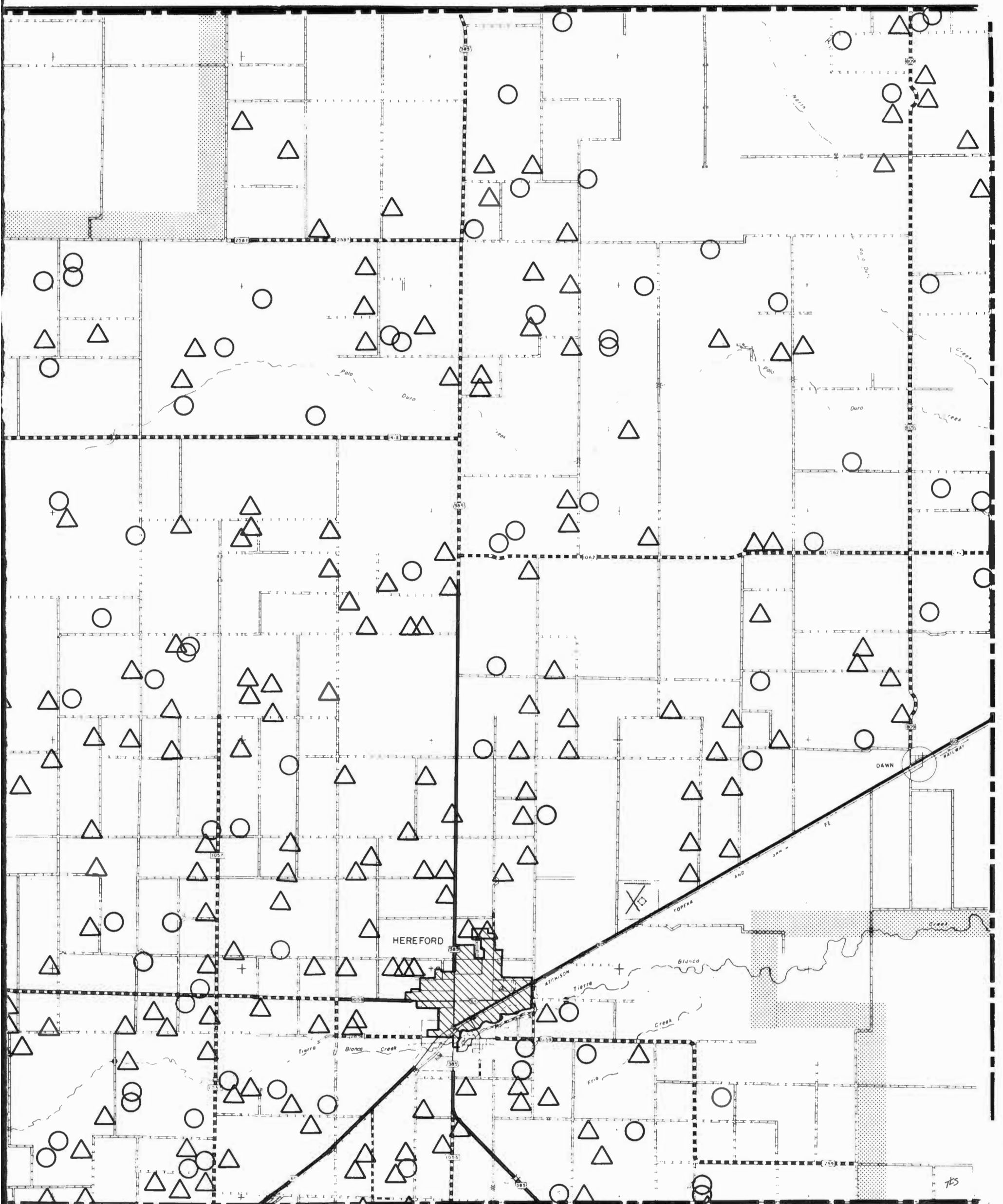


DEAF SMITH

TAILWATER AND PLAYA LAKE

LEGEND  
○ PLAYA LAKE RECOVERY SYSTEMS





**KEY RECOVERY SYSTEMS**  
 ○ TAILWATER RECOVERY SYSTEMS  
 △ TAILWATER RECOVERY SYSTEMS





(L to R) Bob Howell, Chief Chemist for the Holly Sugar refining plant in Hereford, explains the complicated chemical process of processing sugar beets into sugar to Russell Bean, President of the Board of the High Plains Water District, and D. A. Anderson, Head of the Information and Education Department of the Texas Forest Service.



Tom McFarland, General Manager of the Water District, explains the conservation practices that are in use on the High Plains farms. (L to R) Donald Clayton, Springlake; Tom McFarland, General Manager of the Water District; Calvin Hibler of The Texas Educational Agency; Thacher Gary, Professor in the Department of Biology, Southwest Texas State College; Theron D. Carroll, Coordinator of Information and Education for the Texas Parks and Wildlife Department and Russell Bean, President of the Board of Directors of High Plains Water District.

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### T.E.A. Meet . . .

—continued from page 1

not have extensive studies on its natural resources.

The Committee toured the area, as far north as Hereford, and were very impressed by the booming agricultural economy of the High Plains.

### Amendment No. 2 . . .

—continued from page 1

Amendment No. 2 will put Texas in a stronger position for soliciting federal assistance, since the Legislature and citizens of the state will have expressed readiness to provide

financing for their proportionate share of cost in implementing the Texas Water Plan.

2) Vested water rights are protected under the Texas Water Plan.

3) The issuance of bonds will be over a 50-year period, in increments as needed.

4) No bonds are expected to be issued before 1975 for construction of the Texas Water System.

5) No bond proceeds will be used for construction of the Proposed Texas Water System conveyance facility until Texas has assurance that out-of-state water imports are available.

## Tailwater and Playa Lake Recovery Systems . . .

—continued from page 2

1. Prevents the ponding of water at the lower end of the field which interferes with plant development and causes reduced crop yields.

2. Prevents the flooding of adjoining neighbors' farmland thereby reducing the threat of legal action.

3. Prevents the flooding of public roads and eliminates sources of accident.

4. Prevents the flooding of public road drainage ditches and reduces county expense for road maintenance and repairs.

5. Prevents mosquitoes from breeding by eliminating the shallow, tepid water necessary for mosquito breeding.

6. Providing an additional source of irrigation water, in some cases increasing it by as much as 20 to 25 percent.

7. Improves the efficiency of water distribution by allowing the farmer to use a larger head of water to get the water to the end of the rows quicker. This provides for a more uniform moisture penetration by eliminating deep moisture penetrations in the upper portion of the field, not enough moisture in the middle of the field and deep penetration at the lower portion of the field where ponding occurs.

8. Reduces the amount of irrigation labor necessary. Many farmers using recirculation systems state that one man can now irrigate as much as two or three men before the recirculation system was installed.

9. Recovers and reapplies nutrients carried from the farm in tailwater. Water District tests show that about 30 pounds of nitrogen in the form of nitrates were being lost per acre-foot of tailwater. The recirculation system salvaged these nutrients as well as the tailwater.

10. Recovers and reapplies rich top soil carried from the farm in tailwater. Water District tests show that on the average 9 to 10 tons of soils are carried off the farm in each acre-foot of tailwater.

11. Improved plant growth rate because tailwater is much warmer than ground water. Cold ground water causes a temporary cooling of the soil and reduces the rate of plant growth for a few days. The warm tailwater does not lower the soil temperature appreciably, and allows the plant to continue its normal growth rate.

12. Prevents waste and conserves the existing underground water supply and postpones the exhaustion of our underground water supply.

13. Prevents legal action that could close down your well.

### DRILLING STATISTICS FOR JAN., FEB., MARCH AND APRIL

County	Permits Issued	New Wells Completed	Replacement Wells Drilled	Dry Holes
ARMSTRONG	0	0	0	0
BAILEY	51	17	2	1
CASTRO	71	37	2	2
COCHRAN	8	4	2	0
DEAF SMITH	81	46	2	2
FLOYD	38	23	5	1
HALE	7	5	0	0
HOCKLEY	50	33	1	2
LAMB	43	29	8	3
LUBBOCK	48	35	4	0
LYNN	6	10	0	1
PARMER	60	36	2	0
POTTER	1	2	0	0
RANDALL	17	8	1	0
<b>TOTALS</b>	<b>481</b>	<b>288</b>	<b>29</b>	<b>12</b>





A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 15—No. 13

"THERE IS NO SUBSTITUTE FOR WATER"

June, 1969

# VOTE **WATER** FOR TEXAS AMENDMENT 2

Texans on August 5 will determine the course our state will take into the next century. One course, begun nearly two decades ago and ready for action now, will provide adequate water resources to keep Texas moving ahead with vision and determination. The other leads to stagnation and decline because of an inadequate water supply.

## I. WHAT IS AMENDMENT NO. TWO?

Amendment No. Two authorizes the Texas Water Development Board to issue \$3.5 billion in bonds to finance Texas' share of the cost of the Texas Water Plan. This money is not to be used to provide gifts or grants, but will provide temporary financing which will be repaid by water users. The Amendment also removes the 4 per cent ceiling on Water Development Bonds.

## II. WHAT IS THE TEXAS WATER PLAN?

The objective of the Texas Water Plan is to provide adequate water to maintain the growth and prosperity of Texas into the next century when it is estimated that we will have a population of 30.5 million people. The Plan provides for the full development of our water resources and the importation of surplus water from the lower Mississippi River for distribution to areas with declining water resources.

## III. WHO IS TO PAY FOR THE PLAN?

Cost of the \$9 billion Texas Water Plan — Texas' share is estimated at \$3.5 billion — will be shared by local, state and federal governments, with those who ultimately use the water

paying much of the costs of the Plan.

## IV. WHY DOES TEXAS NEED A WATER RESOURCE PLAN?

By the end of this century — in just 31 years — Texas will not have enough water to supply its growing cities, its expanding industry, and its irrigated agriculture. To assure an adequate water supply, the state has prepared a plan for the full development, management and use of its water resources — and an imported water supply — to serve Texas to the year 2020 and to assure *all* Texans water to meet their needs.

## V. WILL THE PLAN PROVIDE ADEQUATE WATER FOR TEXAS?

Yes. With our current major reservoirs (157), the proposed full development of our water

resources (67 dams and reservoirs) and an imported supply of water, Texas can meet its water demands to the year 2020.

## VI. WHO WILL BENEFIT FROM THE PLAN?

The people of Texas will benefit from the Texas Water Plan. The Plan provides for meeting all essential and beneficial water requirements throughout the state. The Plan will provide water for domestic and municipal uses, for industry, for agriculture, for recreation, for our bays and estuaries, and for other beneficial purposes. The Texas Water Plan *will* provide Water for Texas!

Please do your part to see that the future of Texas is assured. Vote Water for Texas on August 5th.

## Precinct 3, Crosby County, Joins Water District

Residents of Precinct 3, Crosby County, voted to join the High Plains Underground Water Conservation District No. 1 on April 22, 1969.

This special election was called by the District's Board of Directors as a result of a petition before the Board pleading for the annexation of Precinct 3 to the Water District. As specified by the petition, only that part of Precinct 3 lying north of the south facing escarpment was added to the District. This part of Precinct

3 borders the eastern Lubbock County line, and is approximately 23 miles long, averaging about 6 miles wide. This area contains 87,960 acres (approximately 137 square miles).

### COUNTY COMMITTEEMEN

On May 6, Judge Cecil Berry, Crosby County Judge, appointed the first five members of the Crosby County Committee. They are: E. B. Fullingim, Chairman; Jack Bowman, member; W. O. Cherry, member; M.

—continued on page 4

## Floyd County Conserves Water

The wasting of water is becoming a thing of the past in Floyd County. The farmers are beginning to realize the importance of conserving water for themselves and for the future of Texas.

The agricultural economy that has made this part of the state great is directly dependent on water. With the declining water table and the importation of water several years in the future, most farmers are trying to conserve the water as much as possible. In Floyd County 159 lake

systems and 73 tailwater pits are in operation. The lake systems can contribute an estimated 10,653 acre-feet of water and the tailwater pit has been estimated at saving 5,840 acre-feet of water.

The farmers realize the water beneath their land is limited and everyone is pumping from the same reservoir and anyone who wastes water is wasting his neighbor's water as well as his own. This attitude has caused farmers to encourage his

—continued on page 4



L. B. (Buddy) BRANDON,  
CLIFF THOMPSON,  
District Secretary, and  
CHESTER MITCHELL.

Mr. Brandon explains that it seems he has twice as much water when he uses his tailwater pit.



RAY ASTRON

Mr. Astron feels that building the recirculating pit was the best thing he has ever done to help his farming operation.



FRANCIS MONTANDON

Mr. Montandon has found the use of his recirculation pits will cut his labor costs. He can use 12-hour sets, get better coverage and not waste his water.



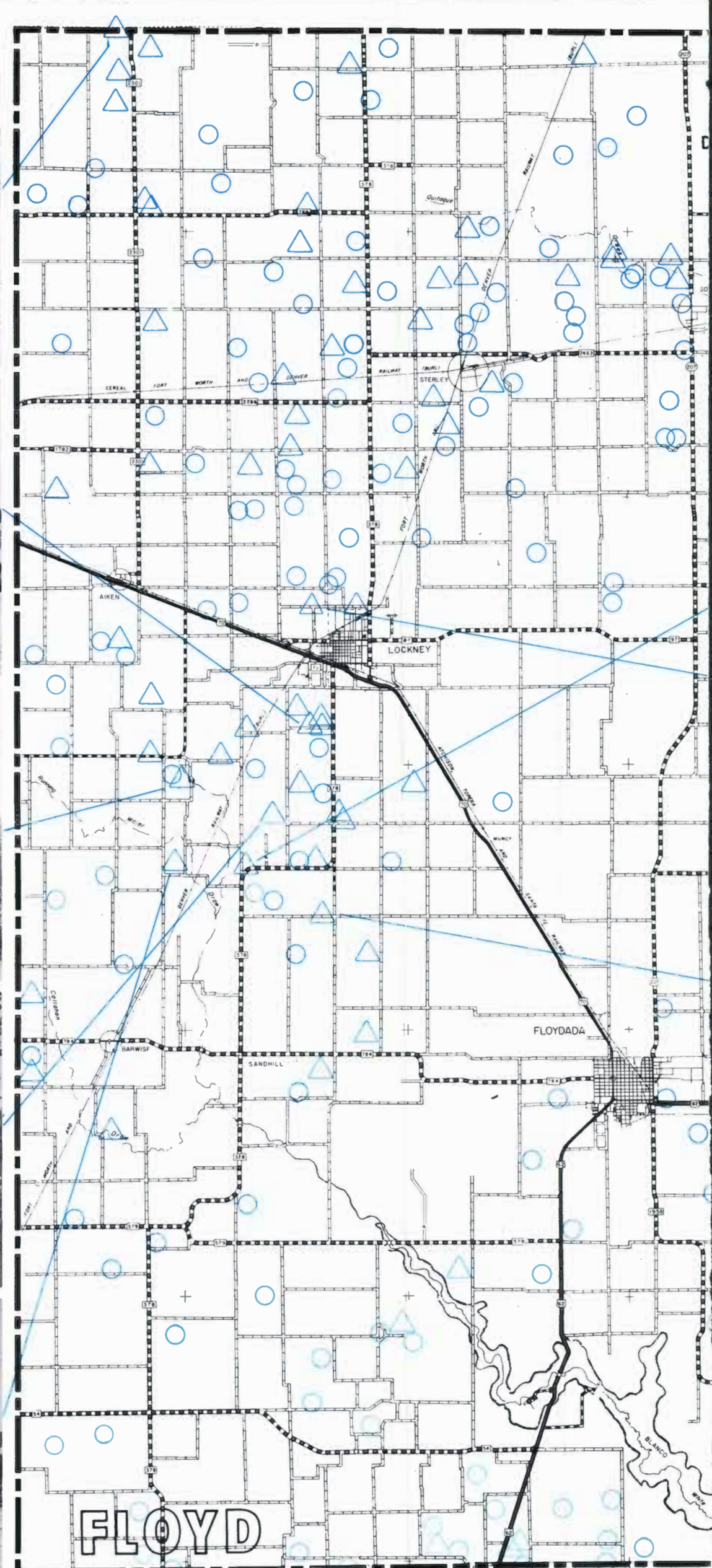
HARMON HANDLEY

Mr. Handley has doubled his production of maize. His poor soil will produce as much as the good soil by using his tailwater recirculation pit.



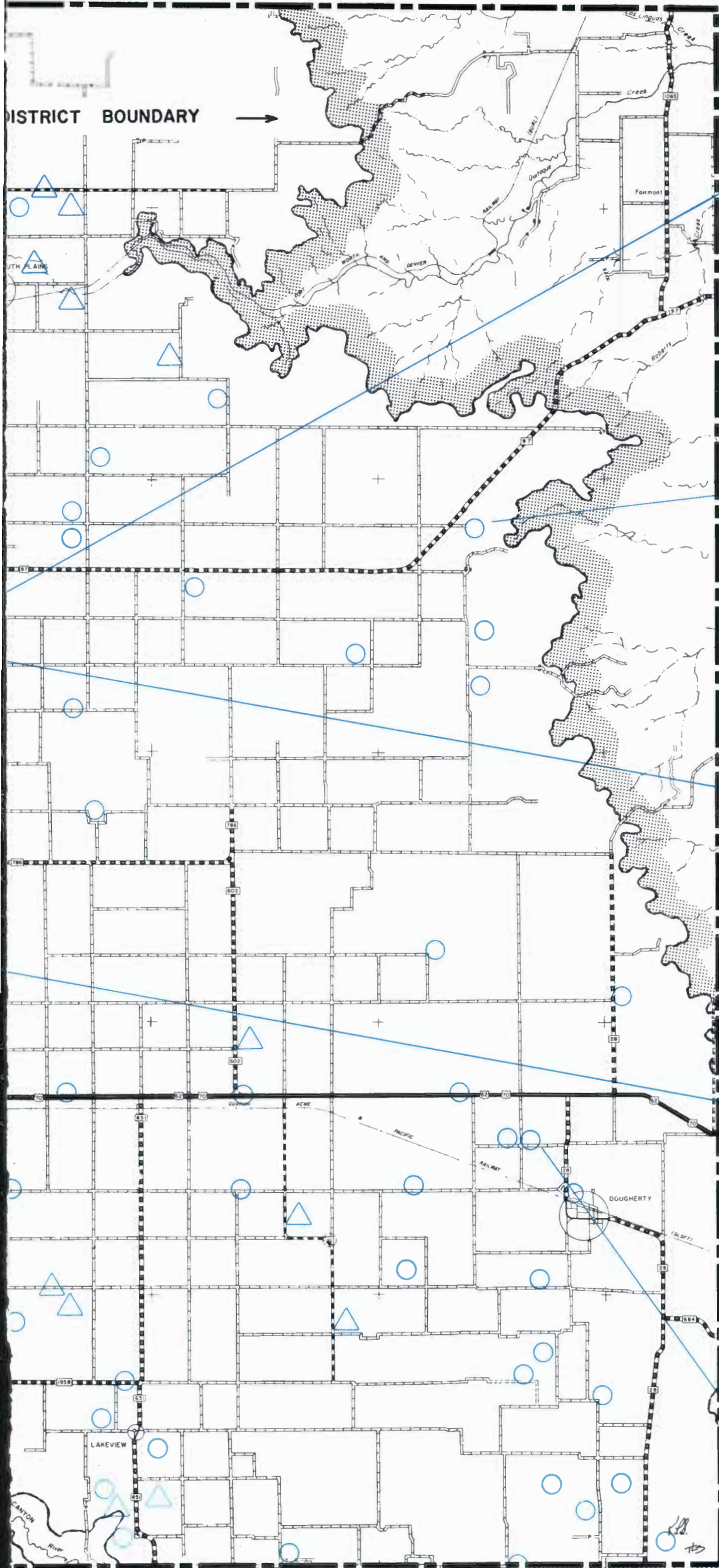
TOM TERILL

Mr. Terill has put into use many good farming practices to prevent any of his water from becoming tailwater. He explained how he dug his tailwater pit in one day at a cost of less than \$50.00.



TAILWATER AND PLAYA L  
LE  
○ PLAYA LAKE RECOVERY SYSTEMS





Chester Mitchell, a member of the Board of Directors of the Water District and an advisor to Water, Inc., has been a leader in water conservation in the High Plains area for years. Mr. Mitchell explained how the use of the tailwater pits enable him to get a much better coverage with his water and sloping land that once would not have a very high production will now produce as much as his flatter land.



W. R. (Raz) and CLINT WARE  
Mr. Ware has modified a lake and uses it for both tailwater and natural runoff collection. He realizes the water has made the plains productive and is trying to get the full use of his water until the importation of water is a reality.



LESLIE FERGUSEN  
Mr. Ferguson states that tailwater is the cheapest water you can get.



Raymond Rucker and Chester Mitchell discuss the clarity of the water that is entering the tailwater pit from the settling basin.



G. W. SMITH  
Mr. Smith is very satisfied with his lake modification. On some years he is able to do all of his watering out of the lake and does not use any of the underground water. He feels that this is the easiest, fastest and cheapest water you can pump in this part of the country.

**LAKE RECOVERY SYSTEMS**  
LEGEND  
△ TAILWATER RECOVERY SYSTEMS



### Crosby County Precinct 3 . . .

—continued from page 1

T. Darden, member; and Kenneth Gray, member.

The newly appointed Committeemen drew lots for lengths of terms. Messers Fullingim, Cherry and Darden are to serve until the District's general election of January 11, 1971; while Messers Bowman and Gray are to serve until the general election of January 12, 1970. After expiration of the appointed terms, Committeemen must be elected to this office. The Crosby County Committeemen elected E. B. Fullingim Chairman.

County Committeemen are to pass on the validity of applications for well permits, and to submit, with their recommendations for approval or denial, such applications to the District's Board of Directors.

#### COUNTY OFFICE

Mr. Walter Scheef, owner of the Lorenzo Pump and Machine, Lorenzo, is providing space for the District's Crosby County office. Mrs. Sue Gray has been employed as the secretary to the Crosby County Committee, and will soon be available to receive applications for well permits at the Lorenzo Pump and Machine offices, at 619 Harrison, Lorenzo.

In conformance with the same rule applicable throughout the District, landowners in Precinct 3 will now be required to secure a permit to drill and equip any water well capable of producing more than 69½ gallons per minute. Such wells must be spaced from all existing wells in accordance with the District's spacing rules. Copies of these rules can be secured by visiting or writing any of the District's offices.

#### HYDROLOGIC STUDIES

The task of collecting groundwater data in Precinct 3 has already commenced. Maps showing the locations of all existing irrigation wells—some 774 in number—have been prepared. A program of collecting driller's logs of wells has been initiated. To date, approximately 200 driller's logs of wells in or near Precinct 3 have been collected. These studies are a part of the work that *must* be accomplished before cost-in-water-depletion, income-tax-guideline maps can be prepared. These maps will be used by property owners to claim income-tax allowances on the amount of the an-

nual depletion of the aquifer beneath their property.

Landowners, tenants, well drillers and pump suppliers are asked to make available for copying well logs and well completion reports for wells in, or within two miles (to the east) of, Precinct 3. All information supplied to the District will be returned to the owners of same within one week after receipt by the District.



Mrs. Sue Gray, Crosby County Secretary, left and Cliff Thompson, District Secretary, right are going over Mrs. Gray's duties as County Secretary at a meeting in the Water District Office.

### Floyd County Conserves Water . . .

—continued from page 1

neighbor to use good irrigation practices.

Many farmers see playa lakes as a source of good and cheap water. Tests on playa lakes have proven the following advantages:

1. Utilization of lake water will



Three of the five new County Committeemen for Crosby County are W. O. Cherry standing, and I. to r. seated, E. B. Fullingim and Jack Bowman. Kenneth Gray and M. T. Darden are not pictured.

either offer the farmer an additional supply of water — raising the potential income of the farming unit substantially, or else will prolong his irrigating economy by using this lake water instead of the underground water which is being exhausted.

2. The pumping of water from playa lakes offers vast potential in salvaging valuable land for crop production.

3. Lake water which has been sampled has shown that this water contains between 3 and 15 tons of silt per acre foot. By utilizing lake water this valuable top soil, some of which stays suspended in the lake water, can be redistributed back on the land from which it eroded.

4. Chemical analysis of lake water has shown that this water contains most of the major, minor, and trace elements which are necessary for the production of crops grown on the High Plains of Texas. Perhaps the most valuable chemical found in lake water is nitrate nitrogen; quantities exceeding 30 pounds per acre foot have been analyzed.

5. Temperatures made of the water pumped from the Ogallala formation average about 63° F, whereas water in playa lakes averages about 80° F from April through September. Most major crops grown on the Southern High Plains of Texas are greatly affected by soil temperatures. The warmer water pumped from playa lake water will not lower soil temperatures as greatly as the colder water pumped from the Ogallala formation and will not, therefore, retard growth.

6. Pumping the water from playa lakes and/or modification virtually eliminates the production of mosquitoes.



Mr. F. A. Rayner, Chief Engineer for the Water District, explains the programs of the District to the Lorenzo Lions Club.

**PLEASE  
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A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 15—No. 14

"THERE IS NO SUBSTITUTE FOR WATER"

July, 1969

# VOTE FOR AMENDMENT 2 ON AUGUST 5<sup>TH</sup>

Three former governors — Allan Shivers, Price Daniel and John Connally — have joined Gov. Preston Smith in forming the Governor's Committee of 500 to urge approval Aug. 5 of the revolving fund bond issue authority needed to implement the Texas Water Plan.

The amount of bonding authority asked in the constitutional amendment up for voter action on Aug. 5 is \$3.5 billion. This is the estimated state share in the future cost of developing reservoirs, canals and other features to be needed in the implementing of the Texas Water Plan.

Adoption of the water bond amendment will put Texas in position to match federal and local funds as re-

quired in the future as the massive plan's details materialize.

It is important to remember that the bonds to be issued under this authority will be repaid by water users. As they repay loans, the funds will be available for new issues. The revolving fund concept for water projects began in 1957 when the first such constitutional amendment was adopted overwhelmingly. By 1962 it was apparent that the maximum limit fixed in that amendment was too low, so a superseding amendment was offered and adopted to authorize up to \$200 million in water development bonds.

As the Texas Water Plan took shape, was amended, revised and expanded in order to meet Texas' water

supply needs for the next 50 years, it raised the question of how the state should finance its part of this plan.

The experience of the existing water development bond program dating back to 1957 showed the soundness of this approach. The main need was to increase the top limit of bonding authority to cover the half-century ahead, hence the \$3.5 billion amendment. This has received near-unanimous approval from the 61st legislature. The people will decide the matter Aug. 5.

A complicating factor is that the Aug. 5 constitutional amendment balloting includes a dozen different proposals on as many subjects. Gov.

Smith and his predecessors know from their long experience in state affairs that when the legislature loads a constitutional amendment ballot with a number of controversial subjects the tendency of many voters is to register a negative answer on all of them. Thus the Governor's Committee of 500 has been organized to carry into all 254 counties of Texas the urgency of saying "yes" to the water development bond amendment.

To keep TEXAS the number one STATE of the Nation in Industrial, Population and Economic growth, everyone should SUPPORT and VOTE for Amendment No. 2 August 5, 1969.

## Mankind Bent Upon Effecting Its Own Extinction

*First of a 3-Part Series*

By JOSEPH L. MYLER

WASHINGTON (UPI) — Man is poisoning his world.

He has been labelled, with strong justification, the dirty animal.

He has managed to make his rivers rotten. He has transformed green pastures into deserts. He has clogged the air with chemicals which menace health and dust which is changing the climate. He is a menace to himself and other species.

He has turned large areas of his world into junk heaps, piled high or layered deep with indestructible cans or plastic containers. Americans alone discard more than a billion tons of solid waste a year and the total is growing.

Man is beginning to face up to the problem, but only slowly and against great obstacles because of government and industrial considerations. All

Unless he is willing to spend billions upon billions to undo what he has done — and perhaps even change some of his basic ways — he really may be gasping for breath in a few decades.

In the developing nations, nearly a billion people get their water from unsanitary sources and half of them get sick every year as a result. Even in the United States, half the people depend on water supplies which don't meet federal standards or are of unknown quality.

Rivers of so-called developed nations have been turned into sewers of civilization to get rid of unwanted industrial wastes. The oceans are being contaminated with agricultural poisons which drain into streams and are carried away to the seas.

By exhausting warm water from our power cooling plants into the ocean, we are threatening marine life. All

along we have drained the priceless topsoil of our fields into silting rivers. We have denuded many of our forests.

### *Dangerous Fumes*

Millions of workers are exposed to potentially dangerous concentrations of dust, fumes, gases and vapors. No one knows what the noise generated by modern machines and cities is doing to man's nervous system.

As J. George Harrar of the Rockefeller Foundation has said, "man himself is the greatest threat to his environment. . . . we have now successfully begun to contaminate what we have not yet destroyed."

None of this happened overnight. Once the oceans were thought to be endless, the land infinite and the atmosphere limitless. Now man's survival is known to depend on how he husbands a relatively thin layer of soil, water and air tightly wrapped around our planet's surface.

Nature with its wind and water erosion and climatic changes has been alerting the environment for millions of years. But the possibility that one species might make the world uninhabitable did not arise until 8,000 years ago when the hunter, who simply ranged the land in search of food, evolved into the farmer who plowed and uprooted it.

Next came the city and then the industrial society, which multiplied the threat many times over.

Consider what man has done to one indispensable element of our biosphere — water.

Water in a sense is the most precious stuff on this planet.

### *Destroy Lakes*

Yet we waste it, we pollute it, we threaten the existence of replaceable underground reserves which took nature thousands of years to establish,

—continued on page 3





A MONTHLY PUBLICATION OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1

1628 15th Street, Lubbock, Texas 79401

Telephone PO 2-0181

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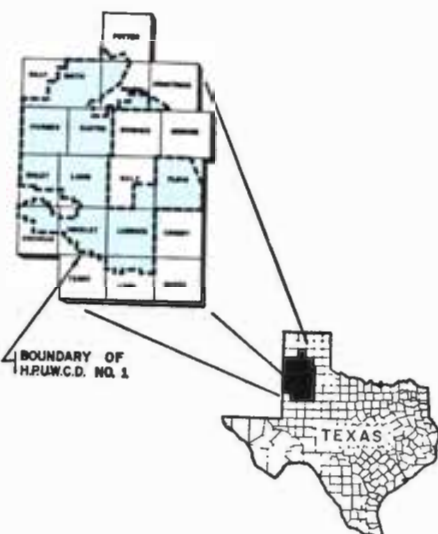
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# LOUISIANANS ANTICIPATE FINDING THAT THE MISSISSIPPI HAS A SURPLUS FLOW

by  
**GEORGE A. WHETSTONE,**  
*Professor of Civil Engineering,*  
*Texas Technological College*

"We'll be the last to take a dog-in-the-manger attitude," Calvin T. Watts, Assistant Director, Louisiana State Department of Public Works, told an audience of ninety at a Water Resources Institute meeting at Louisiana Tech, Ruston, Louisiana, on June 19th.

In an all-day session representatives

Watts emphasized that Louisiana must complete a five-phase inventory of water needs and water resources before concluding that any surplus exists. This study, which will result in a Louisiana Water Plan, has a target completion date of December 31, 1971.

For two and one-half centuries Louisiana's basic water problems have been those of too much water. The State has spent two billion dollars on levee systems for flood protection of one-third of the State and on drainage



(l to r) McDermott, Watts, Boswell, Yantis, Reynolds, Bayley, and Burleigh.

of the States of Louisiana, Texas, and New Mexico, of the Corps of Engineers, of the Bureau of Reclamation, and of the Western States Water Council, in individual addresses and in a panel with vigorous audience participation, stated their views and reported on the status of their investigations into the feasibility of the diversion of Mississippi River water to Texas and New Mexico.

Speaking on the "Proposed Diversion of Mississippi River Water from the Viewpoint of the Basin of Origin",

facilities for two-thirds of the State. In recent years, some local water deficiencies have been noted. Tidal waves have brought salt water to the New Orleans municipal intake; salt water encroachment has occurred in coastal aquifers; estuary salinity has in some times and places been pronounced; and projected industrial needs in the Louisiana portion of the Sabine Basin will exceed the supply in a decade.

Watts displayed a basic apprecia-

**MISSISSIPPI RIVER WATER EXPORT STUDY**  
 COOPERATING AGENCIES

<p><b>WATER-USE STUDIES</b></p> <p><b>IRRIGATION</b>                  ECONOMIC RESEARCH SERVICE                  FOREST SERVICE                  GULF SOUTH RESEARCH INSTITUTE                  SOIL CONSERVATION SERVICE</p> <p><b>MUNICIPAL AND INDUSTRIAL WATER SUPPLY</b>                  GULF SOUTH RESEARCH INSTITUTE</p> <p><b>NAVIGATION</b>                  MISSISSIPPI RIVER COMMISSION</p> <p><b>WATER QUALITY</b>                  FEDERAL WATER POLLUTION CONTROL ADMINISTRATION                  GULF SOUTH RESEARCH INSTITUTE</p> <p><b>FISH AND WILDLIFE</b>                  BUREAU OF COMMERCIAL FISHERIES                  BUREAU OF SPORT FISHERIES AND WILDLIFE                  LOUISIANA COASTAL STUDIES INSTITUTE                  LOUISIANA WILDLIFE AND FISHERIES COMMISSION</p> <p><b>RECREATION</b>                  BUREAU OF OUTDOOR RECREATION                  DEPARTMENT OF AGRICULTURE                  MISSISSIPPI RIVER COMMISSION</p> <p><b>MARSH RESTORATION</b>                  FISH AND WILDLIFE SERVICE                  MISSISSIPPI RIVER COMMISSION (CSI)</p>	<p><b>ECONOMIC BASE STUDY</b>                  ECONOMIC RESEARCH SERVICE                  GULF SOUTH RESEARCH INSTITUTE                  MISSISSIPPI RIVER COMMISSION                  OFFICE OF BUSINESS ECONOMICS</p> <p><b>GROUND-WATER STUDIES</b>                  U.S. GEOLOGICAL SURVEY</p> <p><b>HYDROLOGY</b>                  MISSISSIPPI RIVER COMMISSION                  MISSOURI RIVER DIVISION                  NORTH CENTRAL DIVISION                  OHIO RIVER DIVISION                  SOUTHWESTERN DIVISION</p> <p><b>RESERVOIR STORAGE STUDIES</b>                  MISSISSIPPI RIVER COMMISSION</p> <p><b>EXPORT ROUTE STUDIES</b>                  BUREAU OF RECLAMATION                  MISSISSIPPI RIVER COMMISSION                  SOUTHWESTERN DIVISION</p>
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DR. BOBBY PRICE  
Director of Water Resources  
Center, Louisiana

tion of the water problems of the High Plains in the recounting of a tour of this area guided by Congressman George Mahon. Louisiana, he observed, had received over a million dollars for some cattle he had seen being fattened in High Plains feedlots. He commended the irrigators and cities of the area for their conservation practices and assured his hearers of the legitimacy of High Plains' needs.

Howard B. Boswell, Executive Director of the Texas Water Development Board, presented the Texas Water Plan emphasizing that all Texas water resources will be fully committed before import is resorted to. Necessity for import, he stated, "is due primarily to the fact that some 75 percent of the water used in Texas is groundwater and much of this water is being used faster than it is being recharged."

Hugh C. Yantis, Jr., Executive Director of the Texas Water Quality Board, stressed the efforts under way in Texas to reuse effluents to stretch the water supply.

S. E. Reynolds, State Engineer of New Mexico, speaking on "Water Planning for New Mexico" outlined the developments designed to utilize the 2.5 million acre-feet per year of surface water available to the State and explained the need for importing a replacement for the 1.6 million acre-feet per year of groundwater now being exhausted. He deplored the "cannibalization" of irrigation rights by cities and industries taking advantage of their ability to outbid agriculture for what may promise to be short-range advantages. "The brotherhood of man and the political interdependence within the nation require a sharing of water resources" he concluded.

Reporting on the historic controversies and emerging understanding of water problems in the Western United

States, Alex D. McDermott of Helena, Montana, Chairman of the Water Resources Committee of the Western States Water Council, laid to rest any hopes of an easy solution by means of a continental scheme. He explained that water resources problems can only become increasingly difficult in the future as the easily-developed sites and unappropriated waters are used. Larger, more costly, more comprehensive projects were seen to be inevitable in the maintenance of the national economy.

Fred H. Bayley, III, Chief, Plan Formulation Branch, Planning Division, Mississippi River Commission, Corps of Engineers, reported on the role of his agency in the Mississippi River Water Export Study. With the cooperation of other offices of the Corps of Engineers, the U.S. Geological Survey, and consultants a study of water resources and needs of the Mississippi River Basin and adjacent watersheds is being pushed. The needs include municipal and industrial, irrigation in the Mississippi Valley, navigation, dilution of thermal and other pollution, bays and estuaries, and others.

Export from the river could be detrimental to some of these uses especially in the four or five months of lowest flow. On the other hand, he pointed out, export could be beneficial to the Mississippi Valley in that a coastal canal in Southwestern Louisiana could distribute water needed for its bays and estuaries, for salinity control in its aquifers, and for rice irrigation in some seasons. It would aid in flood control, in recreation, in navigation and in hurricane protection.

Harry P. Burleigh, Senior Engineer, in the Austin office of the Bureau of Reclamation, spoke of his intimate acquaintance with the Ogallala aquifer since he studied it in the 1930's. "There are no tough technical problems in conveying water to the High Plains", he stated. The tough problems would be those of costs — and these would be much less than the losses inherent in failure to secure a supplemental supply.

The possibilities of satisfying water needs by desalination and weather modification were suggested from the floor. They are being actively studied in Texas, New Mexico and elsewhere, but cannot be relied upon with the present technology as a complete solution.

The Symposium at Louisiana Tech, organized by Dr. Bobby E. Price, Director of the School's Water Resources Center, generated no fireworks. It provided a forum wherein the problems of Texas and New Mexico were ably explained and sympathetically understood by men responsible for recommending water policy of Louisiana and of federal agencies.

It will require time to complete the studies of the Mississippi Basin's future needs. They are being made by men of integrity cognizant of the long-range national consequences of their reports. We may legitimately hope for a fair deal. Water allocation, how-

## Mankind Bent Upon Effecting Own Extinction...

—continued from page 1

we destroy the beauty and the life of once sparkling streams and deep blue lakes.

What is so precious about water — that cheap fluid most of us in this country can get in any amount just by turning a tap?

Throughout human history water has been the great limiter. No civilization has ever risen without a plenitude of water. When water runs out, or becomes unusable, civilizations die.

Men have killed each other for water, whether at some isolated spring in the 19th century American west or in ancient Mesopotamia where human beings warred for control of the Tigris and Euphrates.

Water is one of the reasons for today's bloody rivalry between the Israelis and the Arabs.

The high standard of living in the United States and other affluent nations of the modern world depends on fresh water — lots of it.

Americans use about 310 billion gallons of water a day on the average for public supplies, commerce and industry, irrigation, and rural domestic and livestock needs. On a per capita basis, this is 1,600 gallons a day.

### Underground Sources

Of the annually renewable water supplies available to the United States, about 1.2 trillion gallons a day enter the streamflow from surface and underground sources.

This amount, 1.2 trillion gallons a day, constitutes the nation's ultimate water resource — for homes, industry, irrigation, recreation.

Properly managed, it can be used and reused before release to the oceans. Only a tiny amount is "consumed" in the sense that it is converted into other forms, such as chemical products, or removed as a resource by being turned into vapor.

So the United States is water rich. With all that magnificent streamflow it can never become thirsty. Or can it?

For one thing, the figures are all in averages. The blessing of fresh water from the sky ranges from less than an

inch a year in some parched regions the southwest to more than 200 inches in the Pacific Northwest and parts of Hawaii.

For another, populations and the demand for water are rising faster than man's means for making his water resources available wherever needed for human use.

The world population is expected to double to nearly 7 billion by 2000. Says Dr. Raymond L. Nace, research hydrologist of the U.S. geological survey:

"The problem is not whether water supplies are running out, but whether people are outrunning the supplies. Water supplies have finite limits, but the demands of people on the supplies have no known limit."

### Global Problems

Unless he gives up piecemeal, temporary solutions to local water problems and concerns himself with the long-term global problems, man will be in trouble. For that matter, he already is.

Take pollution. To list the specific pollutants which man dumps into his water supply would take many pages.

They range from raw sewage to chemical fertilizers and animal dung, from acids and poisons generated by industry to silts and salts drained from strip mines, city streets and farmlands, from crankcase oils and detergents to disease carrying bacteria, from herbicides and pesticides to radioactive contaminants from mines and atomic plants.

Congress has enacted laws to control water pollution and is studying new ones. But the pollutant load is steadily increasing, and some of the problems involved seem almost too difficult to be solved by legislation alone.

Listen again to Nace of the geological survey:

"Out of its total potentially controllable liquid assets the United States uses 95 per cent chiefly as a conveyor belt on which to send waste products out to sea.

"The major use of free-running water in industrial nations is not industry, as published statistics seem to show, but waste disposal. Our rivers are open sewers."

### Destroy Fish

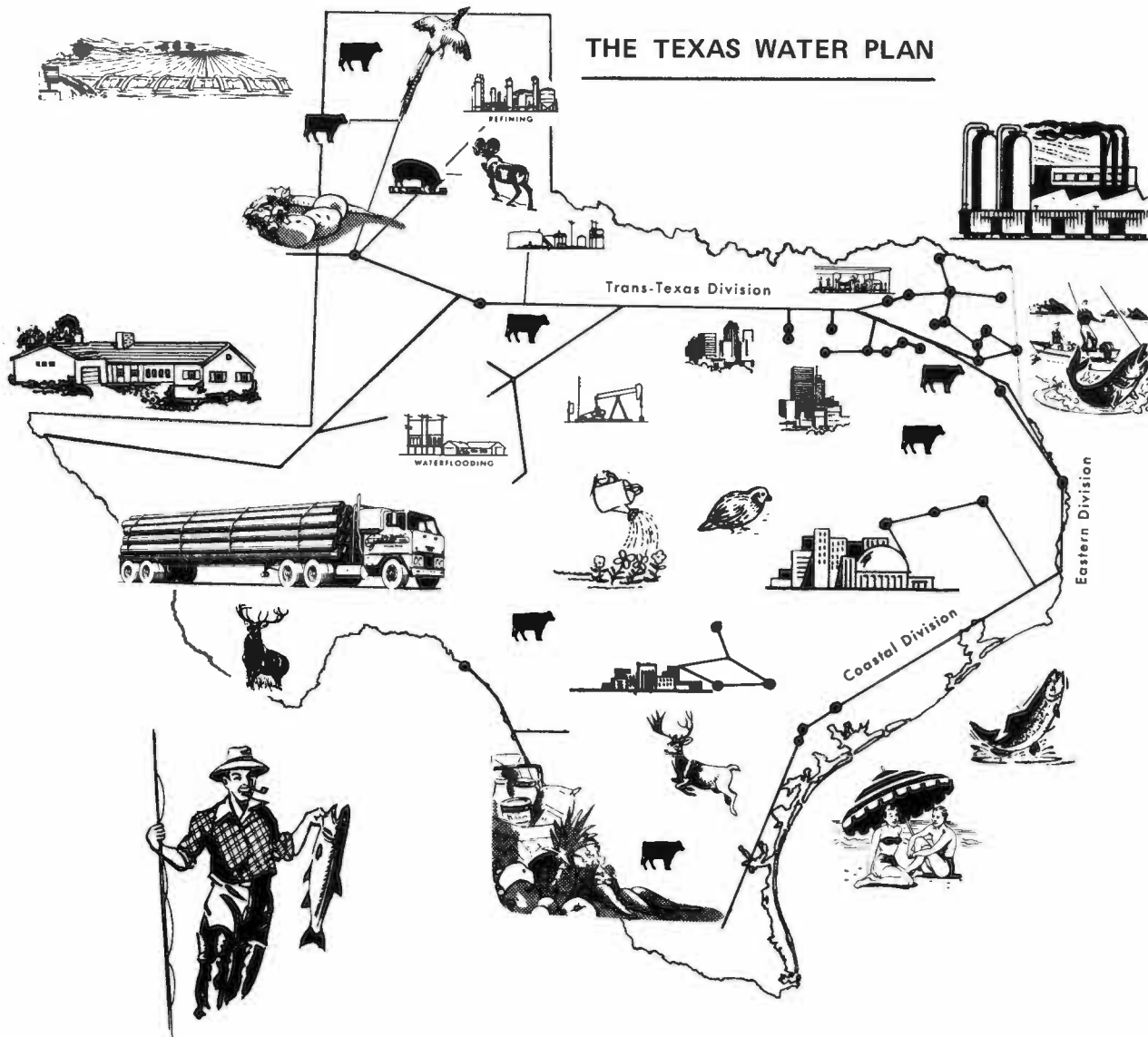
These pollutants also are killing some of our lakes. Nutrients from wastes or farm fertilizers have created

ever, is a political process. The clamor for undiminished flows to the estuaries and marshes will ring loud in Louisiana. Texas' case for sustaining an agricultural economy must be presently ably and often so that reasonable men in the Mississippi Valley may understand the justice of our desires. To do less is to risk defeat by default.

—continued on page 4



# Providing Future Water Supplies



## FOR ALL TEXANS

### Mankind Bent . . .

—continued from page 3

“algal blooms” which result in depletion of oxygen in the water, destroy fish, and set the stage for ultimate transformation of a lake into a marsh and eventually a meadow.

Lake Erie may already be doomed by this cycle. Lake Michigan is in danger.

According to the recent report of the Marine Science Commission, man has created a “devil’s brew of pollution” which constitutes “a growing national disgrace.”

How serious is all this in the world scheme? Dr. Lamont C. Cole of Cornell University has warned that mankind seems bent upon his own extinction.

*Next: The Crisis On The Horizon.*



**Water Is Your  
Future,  
Conserve It!**

PLEASE  
CLOSE  
THOSE  
ABANDONED  
WELLS

HIGH PLAINS UNDERGROUND WATER  
CONSERVATION DISTRICT NO. 1  
1628 FIFTEENTH STREET  
LUBBOCK, TEXAS 79401





A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 15—No. 15

"THERE IS NO SUBSTITUTE FOR WATER"

August, 1969



TOM MCFARLAND

## McFarland Resigns District Managership

Tom McFarland, General Manager of the High Plains Underground Water Conservation District No. 1 for nearly 18 years resigned August 7, 1969. He has been the District's only general manager.

"We've been in all kinds of problems, fought all kinds of battles," McFarland said of his years with the District. But he said he was "very proud" of the District's accomplishments. McFarland said he had "thought about stepping out for some time" and had "considered it quite seriously a couple of years ago." He did not announce his future plans, except to note that he would take a vacation.

The Members of the Board of Directors praised McFarland for his service to the people of this area, and throughout Texas, for his work on numerous water projects in the public interest.

Through the years, McFarland and the more than 30 other former District employees — people like W. L. Broadhurst, now District Chief of the U.S. Geological Survey, Alabama District; Bruce Fink, Head of the Subsurface Disposal Section, Texas Water Development Board; Tom Moorehead, now with Texas Tech University; Y. F. Snodgrass, Public Relations, Grain Sorghum Producers Association; Dr. Donald Reddell, Assistant Professor, Texas A&M University; Bill Waddle, now General Manager of the Texas Water Conservation Association; H. G. Wells, Attorney; Allan White, Federal Land Bank; Gordon Willis, Water Treatment Superintendent, City of Lubbock; A.

## APATHY DEFEATS AMENDMENT 2

By F. A. RAYNER

With only 18 percent of the nearly 3.5 million registered voters going to the polls on August 5, Amendment 2 was defeated by the narrow margin of only 6,277 votes.

The passage of this proposition would have amended the Texas Constitution to empower the Texas Legislature to authorize the Texas Water Development Board to issue up to 3.5 billion dollars in additional water-development bonds. However, this amendment to the Constitution would also require a two-thirds majority vote by the elected members of both the House of Representatives and the Senate and, approval by the Attorney General, before any such bonds could be sold. These provisions would have made this a very democratically controlled bond issue. Perhaps these built in guarantees so eased the voters concern as to make them exhibit the apathy shown by the very light turnout.

Whatever were the reasons, the economic and ecologic well being, and overall general welfare, of Texas' present and future generations took a back seat to indifference on August 5, 1969.

Comparing statewide voter turnout (18 percent) to that of the Southern High Plains, and particularly with that within our District, the West Texas voters are due some accolade for their response to this proposition. Even though only about 24 percent of the registered voters turned out, they nevertheless endorsed this Amendment by a ratio of approximately 4.5 to one. This response is interesting inasmuch as voters in this area endorsed a constitutional amendment that did not directly earmark any funds to transport irrigation water to this area. However, this apparent paradox can be understood when one considers that West Texans have al-

—continued on page 2

Wayne Wyatt, Head of the Water Level Section, Texas Water Development Board; and many others have, through personal dedication, contributed each his full share to the many District accomplishments. For these contributions the District can take pride.



FRANK A. RAYNER

## Rayner Appointed Acting Manager

Frank A. Rayner, the Chief Engineer of the High Plains Underground Water Conservation District No. 1 since August 1966, was appointed the District's Acting Manager on August 7, 1969.

Rayner received a B.S. degree in Geological Engineering from Texas A&M University in 1958. He has taken graduate level courses in ground water geology and hydrology at Texas A&M and Texas Tech.

A registered professional engineer, Rayner is a member of the Texas Society of Professional Engineers.

In 1958, Rayner joined the Texas Board of Water Engineers as a geologist. The following year he became engineer in charge of the Lubbock office. He served in this capacity (officing with the District) until August 1964; at which time he returned to Austin to become the Assistant Director of the Ground Water Division of the Texas Water Development Board. For two years Rayner was in charge of the Surface Casing and Subsurface Disposal Sections (water quality protection) of the Ground Water Division.

As the District's Chief Engineer,

## Water Study Committee Approved

Representative Bill Clayton's resolution to set up a joint committee to study the state water situation, including possible ways to finance the Texas Water Plan, has passed both the House and Senate.

The committee will consist of three Senators, three House Members, and three private citizens appointed by the governor.

Clayton's resolution calls for a study of the Texas water situation and federal and state proposals concerning it; any changes needed in state laws concerning water protection and development; the organization of state water agencies; ecological effects that might result from implementation of the plan; and alternative methods of financing the plan.

This committee will hold hearings throughout the state.

Rayner was responsible for the development and administration of research and engineering.

In a recent letter sent to the 80 elected officials that collectively set policy and govern the District's operation, Rayner stated:

"I want you to know that I am dedicated to the principles of: 1) private ownership of groundwater; 2) limiting laws, rules and regulations that govern the use of groundwater to only those laws, rules and regulations absolutely necessary to assure equitability of groundwater development; and the temperance of the enforcement of such laws, rules and regulations with human understanding and reasonableness; 3) an open ear to any and all complaints and suggestions as to how to better manage the District's activities; and to manage such activities within the District's annual income, and in accordance with the laws that govern its creation and its operation."





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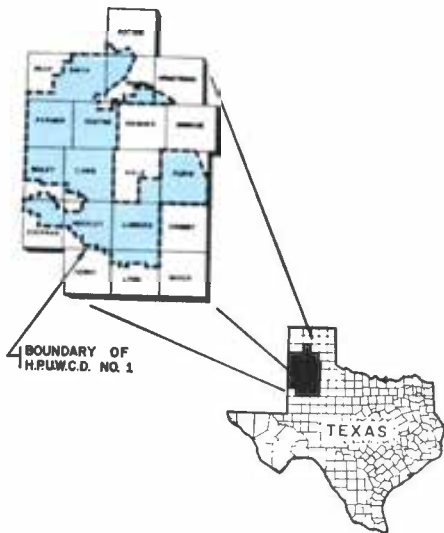
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- Jimmy Ross ..... Chief Engineer
- Albert W. Sechrist ..... Public Relations
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- Herb Spradlin ..... Field Representative
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Lloyd Throckmorton, 1971 ..... Box 115, Muleshoe  
Ernest Ramm, 1970 ..... Rt. 2, Muleshoe  
W. L. Welch, 1970 ..... Star Rt., Maple  
R. L. Davis, 1971 ..... Box 61, Maple  
Jessie Ray Carter, 1972 ..... Rt. 5, Muleshoe  
Committee meets last Friday of each month at 2:30 p.m., 217 Avenue B, Muleshoe, Texas.
- Castro County**  
E. B. Noble  
City Hall, Dimmitt, Texas  
Dale Maxwell, 1970 ..... Hiway 385, Dimmitt  
Frank Wise, 1970 ..... 716 W. Grant, Dimmitt  
Donald Wright, 1971 ..... Box 65, Dimmitt  
Morgan Dennis, 1971 ..... Star Rt., Hereford  
John Gilbreath, 1972 ..... Rt. 2, Hart  
Committee meets on the last Saturday of each month at 10:00 a.m., City Hall, Dimmitt, Texas.
- Cochran County**  
W. M. Butler Jr.  
Western Abstract Co., Morton, Texas  
Ronald Coleman, 1971 ..... Rt. 1, Morton  
D. A. Ramsey, 1970 ..... Star Rt. 2, Morton  
Hugh Hansen, 1970 ..... Rt. 2, Morton  
Don Keith, 1971 ..... Rt. 1, Morton  
Keith Kennedy, 1972 ..... Star Rt. 2, Morton  
Committee meets on the second Wednesday of each month at 8:00 p.m., Western Abstract Co., Morton, Texas.
- Crosby County**  
Sue Gray  
Lorenzo Pump Company  
W. O. Cherry, 1971 ..... Lorenzo  
M. T. Darden, 1971 ..... Lorenzo  
E. B. Fullingim, 1971 ..... Lorenzo  
Jack Bowman, 1970 ..... Lorenzo  
Kenneth Gray, 1970 ..... Lorenzo  
Committee meeting on the first Monday of each month at 1:30 p.m., Lorenzo Pump Co., Lorenzo, Texas.
- Deaf Smith County**  
B. F. Cain, 2nd Floor  
County Court House, Hereford, Texas  
Billy Wayne Sisson, 1971 ..... Rt. 5, Hereford  
Frank Zinser, 1970 ..... Rt. 5, Hereford  
L. B. Wortham, 1970 ..... Rt. 3, Hereford  
Harry Fuqua, 1971 ..... Rt. 1, Hereford  
W. L. Davis, Jr., 1972 ..... Hereford  
Committee meets the first Monday of each month at 7:30 p.m., High Plains Water District office, Hereford, Texas.
- Floyd County**  
Gayle Baucum  
101 South Wall Street, Floydada, Texas  
Pat Frizzell, 1970 ..... Box 1046, Lockney  
Tate Jones, 1970 ..... Rt. 4, Floydada  
M. M. Julian, 1971 ..... Box 65, South Plains  
M. J. McNeill, 1971 ..... 833 W. Tenn., Floydada  
Melvin Jarboe, 1972 ..... Rt. 4, Floydada  
Committee meets on the first Tuesday of each month at 10:00 a.m., Farm Bureau Office, Floydada, Texas.



- Hale County**  
J. B. Mayo  
1617 Main, Petersburg, Texas  
Charles Schuler, 1970 ..... Petersburg  
Don Hegi, 1970 ..... Box 160 A, Petersburg  
Harold D. Rhodes, 1971 ..... Box 100, Petersburg  
J. C. Alford, 1971 ..... Box 28, Petersburg  
W. D. Scarborough, Jr., 1972 ..... Petersburg  
Committee meets first Monday each month at Water District office in Petersburg.

- Hockley County**  
Murray C. Stewart  
208 College, Levelland, Texas  
Ewel Exum, 1971 ..... Rt. 1, Ropesville  
J. E. Wade, 1970 ..... Rt. 2, Littlefield  
Jimmy Price, 1970 ..... Rt. 3, Levelland  
H. R. Phillips, 1971 ..... Rt. 4, Levelland  
Bryan Daniel, 1972 ..... N. Sherman, Levelland  
Committee meets first and third Fridays of each month at 1:30 p.m., 917 Austin St., Levelland, Texas.

- Lamb County**  
Calvin Price  
620 Hall Avenue, Littlefield, Texas  
Gene Templeton, 1971 ..... Star Rt. 1, Earth  
Jack Thomas, 1970 ..... Box 13, Olton  
Lee Roy Fisher, 1970 ..... Box 344, Sudan  
Artis Barton, 1971 ..... Hiway 70, Earth  
W. W. Thompson, 1972 ..... Spade  
Committee meets the first Thursday of each month at 8:00 p.m., Crescent House Restaurant, Littlefield.

- Lubbock County**  
1628 15th Street, Lubbock, Texas  
Glenn Blackmon, 1971 ..... Rt. 1, Shallowater  
R. F. (Bob) Cook, 1970 ..... 804 6th St., Idalou  
Bill Dorman, 1970 ..... 1910 Ave. E, Lubbock  
Andrew (Buddy) Turnbow, 1971 ..... Rt. 5, Lubbock  
Alex Bednarz, 1972 ..... Rt. 1, Slaton  
Committee meets on the first and third Mondays of each month at 1:30 p.m., 1628 15th St., Lubbock, Texas.

- Lynn County**  
1628 15th Street, Lubbock, Texas  
Roy Lynn Kahlich, 1970 ..... Wilson  
Roger Blakney, 1970 ..... Rt. 1, Wilson  
Reuben Sander, 1971 ..... Rt. 1, Slaton  
O. R. Phifer, Jr., 1971 ..... New Home  
Dale Zant, 1972 ..... Rt. 1, Wilson  
Committee meets the third Tuesday of each month at 10:00 a.m., 1628 15th Street, Lubbock, Texas.

- Parmer County**  
Aubrey Brock  
Wilson & Brock Insurance Co., Bovina, Texas  
Guy Latta, 1971 ..... Friona  
Henry Ivy, 1970 ..... Rt. 1, Friona  
Jim Ray Daniel, 1970 ..... Friona  
Edwin Lide, 1971 ..... Rt. D, Bovina  
Webb Gober, 1972 ..... RFD, Farwell  
Committee meets on the first Thursday of each month at 8:00 p.m., Wilson & Brock Insurance Agency, Bovina, Texas.

- Potter County**  
Fritz Meneke, 1970 ..... Rt. 1, Box 538, Amarillo  
Jim Line, 1971 ..... Bushland  
Vic Plunk, 1970 ..... Rt. 1, Amarillo  
Temple Rodgers, 1971 ..... Rt. 1, Amarillo  
F. G. Collard, 1972 ..... Rt. 1, Amarillo

- Randall County**  
Louise Knox  
Randall County Farm Bureau Office, Canyon  
R. B. Gist, Jr., 1971 ..... Rt. 3, Box 43, Canyon  
Carl Hartman, Jr., 1971 ..... Rt. 1, Canyon  
Marshall Rockwell, 1970 ..... Canyon  
Richard Friemel, 1970 ..... Rt. 1, Canyon  
Leonard Batehorst, 1972 ..... Rt. 1, Canyon  
Committee meets on the first Monday of each month at 8:00 p.m., 1710 5th Ave., Canyon, Texas.

## AQUIFER-MODELING RESEARCH MEETING

The fifth planning and work review meeting of the Tech-District aquifer-modeling research project (the Cross Section, September 1968) was held in the District's Lubbock offices on August 13th. This meeting marked the beginning of the second year of this research project.

The object of this research is to develop a model of the Ogallala Aquifer — this area's primary water supply. It is hoped that this model can be so designed as to function as an accurate predictive tool through successive stages of depletion of this aquifer.

This model is expected to be very useful to the District's water conservation programs, and to other agencies and individuals who are developing plans for the importation of surface water to this area.

Dr. Dan Wells, Director of the Water Resources Center, Texas Tech University, and Frank Rayner, Acting Manager and Chief Engineer for the District, are co-directors of this project for Tech and the District respectively.

Participating in this planning meeting, in addition to Wells, and Rayner, were Albert Sechrist, Water District Engineer; Bill Claborn, Assistant Professor of Civil Engineering at Tech; T. A. Austin, Tech Civil Engineering Department; Dr. David K. Todd, Professor of Civil Engineering, University of California at Berkeley, and Charles F. Meyer, Project Manager for Water Resources Research, General Electric TEMPO, Santa Barbara, California. TEMPO and their consultant, Dr. Todd, are consultants to the Tech-District project.

The overall progress of the study to date was discussed and satisfactory progress was reported.

This research is being funded by a \$98,578.00 grant from the Office of Water Resources Research (OWRR), United States Department of Interior, to Tech and the District.

Dr. Edward Altouney, OWRR Water Research Scientist, is coordinating the Tech-District research with OWRR.

Mr. Albert H. Schwartz is the Acting Director of OWRR.

## Amendment No. 2 . . .

—continued from page 1

ways faced water problems, and they realize that if they can help to implement large-scale water development that will satisfy the State's municipal and industrial needs, this would accelerate other efforts to transport irrigation water to West Texas.

The history of water-level measurements made in wells tapping this area's primary water supply, the Ogallala aquifer, show without a doubt the eventual decline in its ability to supply our water needs long before the turn of the century. We must secure a supplemental water supply if we are to continue to prosper. It is to this end that commits the District to support all those who plan toward this eventuality.

The U. S. Bureau of Reclamation, in cooperation with the U. S. Corps of Engineers, is continuing its reconnaissance study; investigating the feasibility of, and methods for, transporting water to West Texas and Eastern New Mexico.

A mammoth economic input-output study, under the direction of Dr. Herbert Grubb, Office of the Governor; studies by the U. S. Geological Survey; the Texas Water Development Board's, "The Texas Water Plan"; and studies by other organizations and individuals will aid in the efforts to bring water to West Texas.

These efforts shall continue, irrespective of the disappointment of August 5. Therefore, now is not the time to lament, rather, it is the time to evaluate our past failures, and plan for future successes. The voter response map on page 4, and the statistical analysis of the vote on Amendment 2, as presented in the tables on page 3, tell the story of August 5, 1969 — they also represent the work outline for the future.

NOTE: The by-county tabulation of votes for and against Amendment 2, and the number of registered voters, were supplied by the office of the Secretary of State (Martin Dies, Jr.), through Representative Bill Clayton's office.

**Water Is Your Future, Conserve It!**



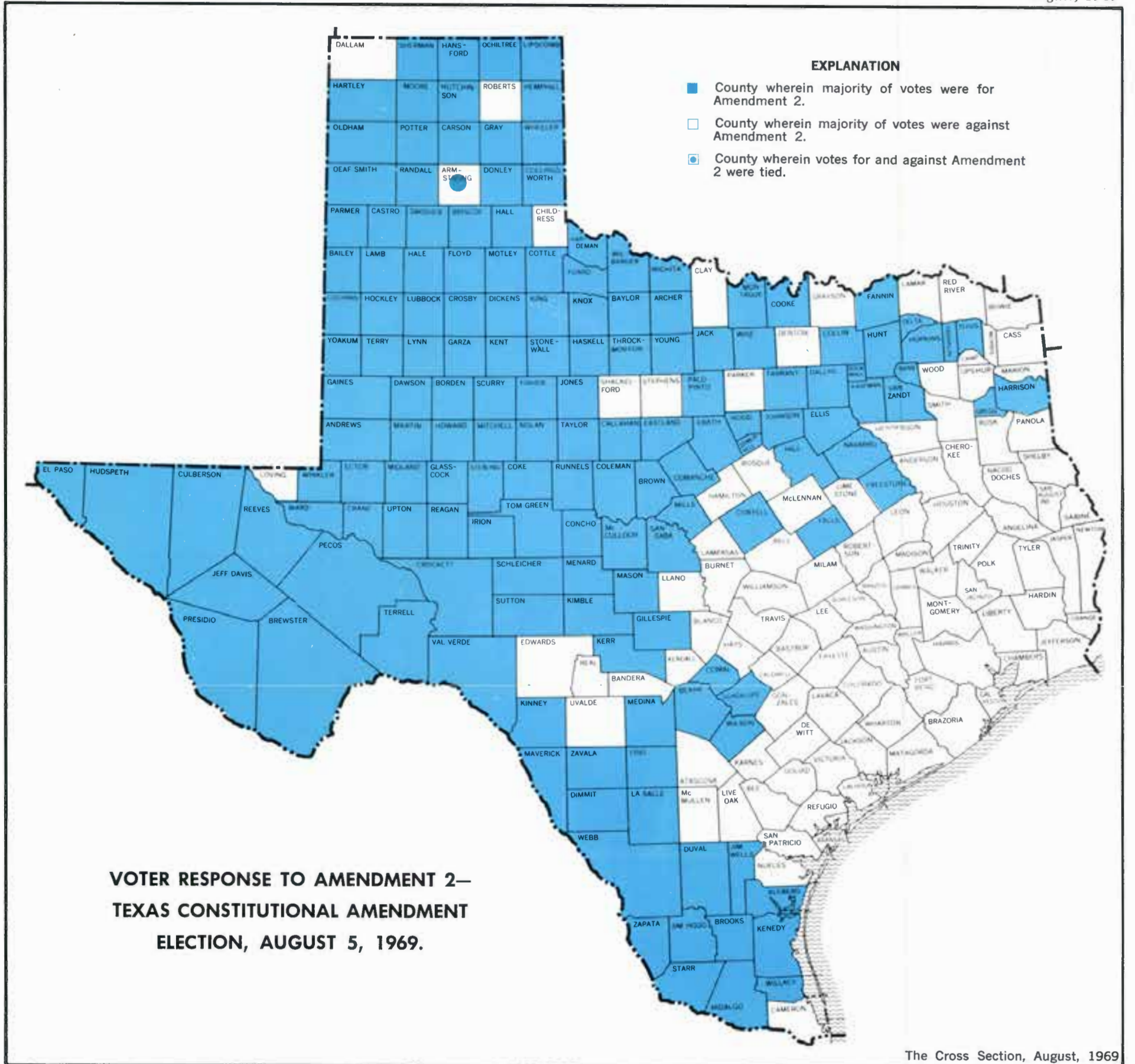
Left to Right: (front row) Austin, Rayner; (back row) Claborn, Todd, Meyer, Sechrist, and Wells.



VOTER RESPONSE TO AMENDMENT 2

County	1965		Total	% of		No. of	% of	County	1965		Total	% of		No. of	% of				
	Estimated	No. of		Votes	For				Against	Population		For	Against			Votes	For	Against	Reg'd.
Anderson	30,046	858	1,141	1,999	43	57	1.33	11,585	17	Jones	20,119	756	309	1,065	71	29	2.45	5,840	18
Andrews	10,507	963	272	1,235	78	22	3.54	3,701	33	Karnes	14,876	566	640	1,206	47	53	1.13	5,174	23
Angelina	42,815	1,261	1,934	3,195	39	61	1.53	16,086	20	Kaufman	31,270	1,056	823	1,879	56	44	1.28	8,797	21
Aransas	8,055	182	271	453	40	60	1.49	3,056	15	Kendall	6,561	250	500	750	33	67	2.00	2,424	31
Archer	6,157	365	224	589	62	38	1.63	2,357	25	Kenedy	770	62	11	73	85	15	5.64	248	29
Armstrong	2,132	155	155	310	50	50	1.00	1,023	30	Kent	1,708	145	45	190	76	24	3.22	742	26
Atascosa	19,394	462	552	1,014	46	54	1.19	6,727	15	Kerr	20,205	862	808	1,670	52	48	1.07	7,298	23
Austin	15,023	163	664	827	20	80	4.07	4,871	17	Kimble	4,133	180	174	354	51	49	1.03	1,590	22
Bailey	10,335	642	85	727	88	12	7.55	2,623	28	King	543	36	8	44	82	18	4.50	229	19
Bandera	4,114	239	281	520	46	54	1.18	1,943	27	Kinney	2,306	61	40	101	60	40	1.52	755	13
Bastrop	17,266	636	706	1,342	47	53	1.11	6,380	21	Kleberg	29,311	1,424	712	2,136	67	33	2.00	9,504	22
Baylor	5,824	357	250	607	59	41	1.43	2,141	28	Knox	7,672	414	157	571	73	27	2.64	2,477	23
Bee	23,996	472	552	1,024	46	54	1.17	6,936	15	Lamar	35,629	1,173	1,355	2,528	46	54	1.16	11,392	22
Bell	120,083	1,177	2,482	3,659	32	68	2.11	26,705	14	Lamb	24,729	1,895	224	2,119	89	11	8.46	6,759	31
Bexar	771,451	26,559	20,058	46,617	57	43	1.32	243,946	19	Lampasas	9,488	242	590	832	29	71	2.44	3,391	25
Blanco	3,940	148	197	345	43	57	1.33	1,538	22	La Salle	5,761	226	93	319	71	29	2.43	1,577	20
Borden	909	128	30	158	81	19	4.27	419	38	Lavaca	19,696	593	1,271	1,864	32	68	2.14	7,495	25
Bosque	10,787	437	717	1,154	38	62	1.64	4,486	26	Lee	8,721	298	437	735	41	59	1.47	3,428	21
Bowie	66,743	922	1,983	2,905	32	68	2.15	19,131	15	Leon	10,468	277	445	722	38	62	1.61	3,575	20
Brazoria	91,050	1,168	4,675	5,843	20	80	4.00	35,052	17	Liberty	33,622	541	1,313	1,854	29	71	2.43	10,973	17
Brazos	46,485	880	2,790	3,670	24	76	3.17	16,809	22	Limestone	21,483	595	1,077	1,672	36	64	1.81	6,678	25
Brewster	6,930	230	167	397	58	42	1.38	2,489	16	Lipscomb	3,595	172	133	305	56	44	1.29	1,668	18
Briscoe	3,791	363	59	422	86	14	6.15	1,267	33	Live Oak	7,883	197	253	450	44	56	1.28	2,871	16
Brooks	8,938	850	210	1,060	80	20	4.05	3,599	29	Llano	5,620	315	362	677	47	53	1.15	3,017	22
Brown	27,168	976	721	1,697	58	42	1.35	9,994	17	Loving	119	10	11	21	48	52	1.10	81	26
Burleson	10,881	289	522	811	36	64	1.81	3,774	21	Lubbock	177,140	10,495	1,635	12,130	87	13	6.41	46,136	26
Burnet	9,550	443	572	1,015	44	56	1.29	4,830	21	Lynn	11,072	980	187	1,167	84	16	5.24	3,044	38
Caldwell	16,058	442	644	1,086	41	59	1.46	5,470	20	Madison	7,403	146	393	539	27	73	2.69	2,490	22
Calhoun	18,449	346	723	1,069	32	68	2.09	5,636	21	Marion	7,466	261	305	566	46	54	1.17	3,150	18
Callahan	9,142	401	255	656	61	39	1.57	3,304	20	Martin	5,012	252	58	310	81	19	4.34	1,604	19
Cameron	141,671	2,293	2,654	4,947	46	54	1.16	39,476	13	Mason	3,899	198	171	369	54	46	1.16	1,784	21
Camp	8,448	173	299	472	37	63	1.73	3,398	14	Matagorda	29,637	467	1,053	1,520	31	69	2.25	9,418	16
Carson	7,885	560	110	670	44	56	5.09	3,036	22	Maverick	18,076	200	107	307	65	35	1.87	3,864	08
Cass	24,241	599	863	1,462	41	59	1.44	8,582	17	McCulloch	9,008	359	289	648	55	45	1.24	3,176	20
Castro	11,132	980	85	1,065	92	08	11.53	2,967	36	McLennan	152,639	6,125	6,234	12,359	49	51	1.02	45,240	27
Chambers	11,129	209	495	704	30	70	2.37	4,558	15	McMullen	1,145	69	93	162	43	57	1.35	520	31
Cherokee	33,660	528	1,091	1,619	33	67	2.07	9,706	17	Medina	20,370	653	580	1,233	53	47	1.13	6,130	20
Childress	7,537	277	445	722	38	62	1.61	3,255	22	Menard	2,877	193	162	355	54	46	1.19	1,166	30
Clay	7,810	308	268	576	53	47	1.15	3,238	18	Midland	64,704	1,773	1,218	2,991	59	41	1.46	24,353	12
Cochran	7,557	433	69	502	86	14	6.28	1,771	28	Milam	20,464	519	1,229	1,748	30	70	2.37	7,700	23
Coke	3,471	228	67	295	77	23	3.40	1,426	21	Mills	4,501	215	202	417	52	48	1.06	2,056	20
Coleman	12,019	533	392	925	58	42	1.36	5,235	18	Mitchell	10,786	627	191	818	77	23	3.28	3,182	26
Collin	49,802	2,050	1,368	3,418	60	40	1.50	15,579	22	Montague	16,247	501	460	961	52	48	1.09	5,826	16
Collingsworth	5,883	211	180	391	54	46	1.17	2,110	19	Montgomery	34,489	547	1,498	2,045	27	73	2.74	15,957	13
Colorado	18,748	485	823	1,308	37	63	1.70	6,663	20	Moore	13,044	628	162	790	79	21	3.88	5,177	15
Comal	21,791	815	609	1,424	57	43	1.34	7,112	20	Morris	11,442	369	464	833	44	56	1.26	4,361	19
Comanche	12,919	570	464	1,034	55	45	1.23	4,595	23	Motley	2,883	266	71	337	79	21	3.75	1,070	31
Concho	3,833	241	105	346	70	30	2.30	1,266	27	Nacogdoches	30,358	833	1,377	2,210	38	62	1.65	10,036	22
Cooke	23,389	919	733	1,652	56	44	1.25	8,829	19	Navarro	34,604	1,096	752	1,848	59	41	1.46	10,780	17
Coryell	33,554	734	684	1,418	52	48	1.07	6,326	22	Newton	10,842	304	305	609	50	50	1.00	3,548	17
Cottle	4,029	236	154	390	61	39	1.53	1,402	28	Nolan	17,368	769	264	1,033	74	26	2.91	6,265	16
Crane	4,356	157	127	284	55	45	1.24	1,624	17	Nueces	224,719	4,905	6,805	11,710	42	58	1.39	78,692	15
Crockett	3,893	113	81	194	58	42	1.40	1,455	13	Ochiltree	10,807	298	191	489	61	39	1.56	3,467	14
Crosby	11,810	895	118	1,013	88	12	7.58	3,149	32	Oldham	2,352	183	33	216	85	15	5.54	834	26
Cuberson	3,497	67	46	113	59	41	1.46	929	12	Orange	65,938	888	1,607	2,495	36	64	1.81	21,110	12
Dallam	6,031	165	170	335	49	51	1.03	2,227	15	Palo Pinto	22,968	797	472	1,269	63	37	1.69	9,258	14
Dallas	1,105,594	43,583	28,305	71,888	61	39	1.54	409,088	18	Panola	16,353	613	652	1,265	48	52	1.06	5,893	21
Dawson	20,430	1,167	224	1,391	84	16	5.21	5,506	25	Parker	25,450	621	807	1,428	43	57	1.30	8,899	16
Deaf Smith	18,866	1,203	87	1,290	93	07	13.83	4,528	29	Parmer	11,243	1,005	75	1,080	93	07	13.40	2,801	38
Delta	6,270	422	181	603	70	30	2.33	1,995	30	Pecos	41,792	608	197	805	76	24	3.09	4,307	19
Denton	62,329	1,893	2,120	4,013	47	53	1.12	21,215	19	Polk	14,027	356	569	925	38	62	1.60	5,421	17
De Witt	19,675	418	1,190	1,608	26	74	2.85	6,807	24	Potter	119,778	2,944	1,508	4,452	66				







# THE Cross SECTION

A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 15—No. 16

"THERE IS NO SUBSTITUTE FOR WATER"

September, 1969

## AREA CONSERVATIONIST WINS "STAR" AWARD

Charles Heck, Jr., of Nazareth, received the Star Young Farmer Award of the Panhandle-Plains area.

Heck was named the Star Young Farmer of the Dimmitt chapter in January. He competed against five other finalists for the area award. As the Area I winner, he will compete for the title of Star Young Farmer of Texas, at the State convention in Galveston in January.

Heck, 32, has been farming on his own since 1960, after having farmed with his father for eight years.

Charles has been a leader in water conservation for many years and was one of the first farmers in his area to install tailwater pits and playa modification. His three tailwater pits and one playa modification have eliminated his tailwater problems from his 17 water wells.

He operates a total of 1,920 acres and raises grain sorghum, corn, potatoes, sugarbeets, carrots, lettuce, wheat and cotton.

In addition to being a member of the Dimmitt Young Farmers, Charles is a lifetime member of the Holy Family Church of Nazareth, member of the Knights of Columbus, secretary-treasurer of the Nazareth School Board, president of the Castro County Grain Sorghum Producers Association, trustee of the High Plains Research Foundation, and chairman of the vegetable committee of the Castro County chapter of the National Farmers Organization. He and his wife, Ann, live two miles south of Nazareth. They have five daughters and two sons.

## CASTRO COUNTY CONSERVATION

Castro County farmers are becoming aware of the importance of water conservation. Everywhere you look you can see a new tailwater pit or a lake modification being installed.

In Castro County 147 lake systems and 148 tailwater pits are in operation. The lake systems can contribute an estimated 14,000 acre-feet of lake water and the tailwater pits have been estimated at saving 10,800 acre-feet of water.

(See Map Page 2)



ANN BELL



DANA WACASEY

## Personnel Join District Staff

Ann Bell began working part-time on the grant for the Water District in October, 1968, and began working full-time the first of August, 1969.

Ann graduated from Texas Tech University in 1969 with a B.S. in Geology. While in college, she was a member of the German and Math clubs and was a member of Sigma Phi Omega.

Her husband, Dennis, is a student at Texas Tech University and they reside in Lubbock.

Dana Wacasey, a native of Lubbock, has returned to work for the Water District this September. She has previously worked for the District as secretary from 1957 until 1959. She returned in 1964 and remained on the staff as bookkeeper until January 1967. The past 2½ years she has been employed by South Plains College in Levelland.

She has one son, Desmond Dale, five and one half years old. Her husband, Dale, works for the Texas National Guard. He is the Administrative Supply Technician at the army in Levelland. The family home is in Levelland.

## Water Crisis: Matter of Survival for Life on Earth

(Second in a series and continued from July Cross Section)

By JOSEPH L. MYLER

WASHINGTON (UPI) — Without water there could be no life of any kind on earth. In a sense water is even more precious than oxygen, the "gas of life." For without water there would be no green plants, and green plants supply the oxygen in the air we breathe.

Scientists believe life on earth originated in the primitive seas long before there was more than a trace of oxygen in the atmosphere. Oxygen, and life's dependence on it, appeared only after the evolution of plants.

The blood of animals, including man, still is salty solution similar to

sea water. The sea still surges in the circulation systems of land as well as marine creatures. Most living things are mainly water.

The sea is at once the supplier of fresh water to the land and of oxygen to the air.

More than 70 per cent of our oxygen supply, according to Cornell's Dr. Lamont Cole, comes from microscopic green plants in the sea which, like the plants of land, consume carbon dioxide with the help of solar energy and cast off oxygen as a waste product.

### Destroyed Vegetation

With his bulldozers and concrete and asphalt city-building, road-build-

—continued on page 4

## PERSONNEL CHANGES

The Deaf Smith County office of the High Plains Underground Water Conservation District No. 1, at 317 North Sampson Street, Hereford, has closed on February 1, 1969. Applications for water well permits are now being issued through the County Clerk's office in room 203 of the Deaf Smith County Courthouse, Hereford. Mr. B. F. Cain, County Clerk of Deaf Smith County is serving as the Secretary to the Deaf Smith Committee. Mr. Cain is being assisted by Mrs. Wilma Clark who is maintaining the District's well permit files for Deaf Smith County.

With the closing of the Sampson Street office, Mrs. Mattie K. Robinson ended her nearly nine years of employment with the District. Her many years of experience as a County Secretary will be missed by the District.

Mrs. Doris Hagens left the District staff on July 1, 1969. Mrs. Hagens served as the Secretary to the Bailey County Committee from Jan. 1, 1954 to Jan. 1, 1956; before joining the District's Lubbock office staff as District Secretary on March 1, 1964. Mrs. Hagens may be assisting the District from time to time as the seasonal workload of the of the District's well permitting operations require.

Mrs. Ernestine Cox resigned on July 23, 1969, to accept the position as head of the bookkeeping operations of a local construction company. Mrs. Cox's fine bookkeeping work will be missed by the District. It will be difficult to replace her enthusiasm for the maintenance of accurate fiscal records.

On August 11, 1969, Mrs. Joann Bilbrey submitted her resignation of employment with the District. Mrs. Bilbrey commenced her general secretarial work for the District in May, 1966. She did not disclose her future plans.

Tom McFarland resigned as the District's General Manager on August 7, 1969; Frank Rayner, the District's Chief Engineer was appointed Acting Manager on that date.





Left to right: KENNETH SEALES, District Field Representative, GREGG SIDES and GEORGE SIDES.

Mr. Sides feels that water conservation is very important to the future generations. The water we waste today is water we are taking away from our children.



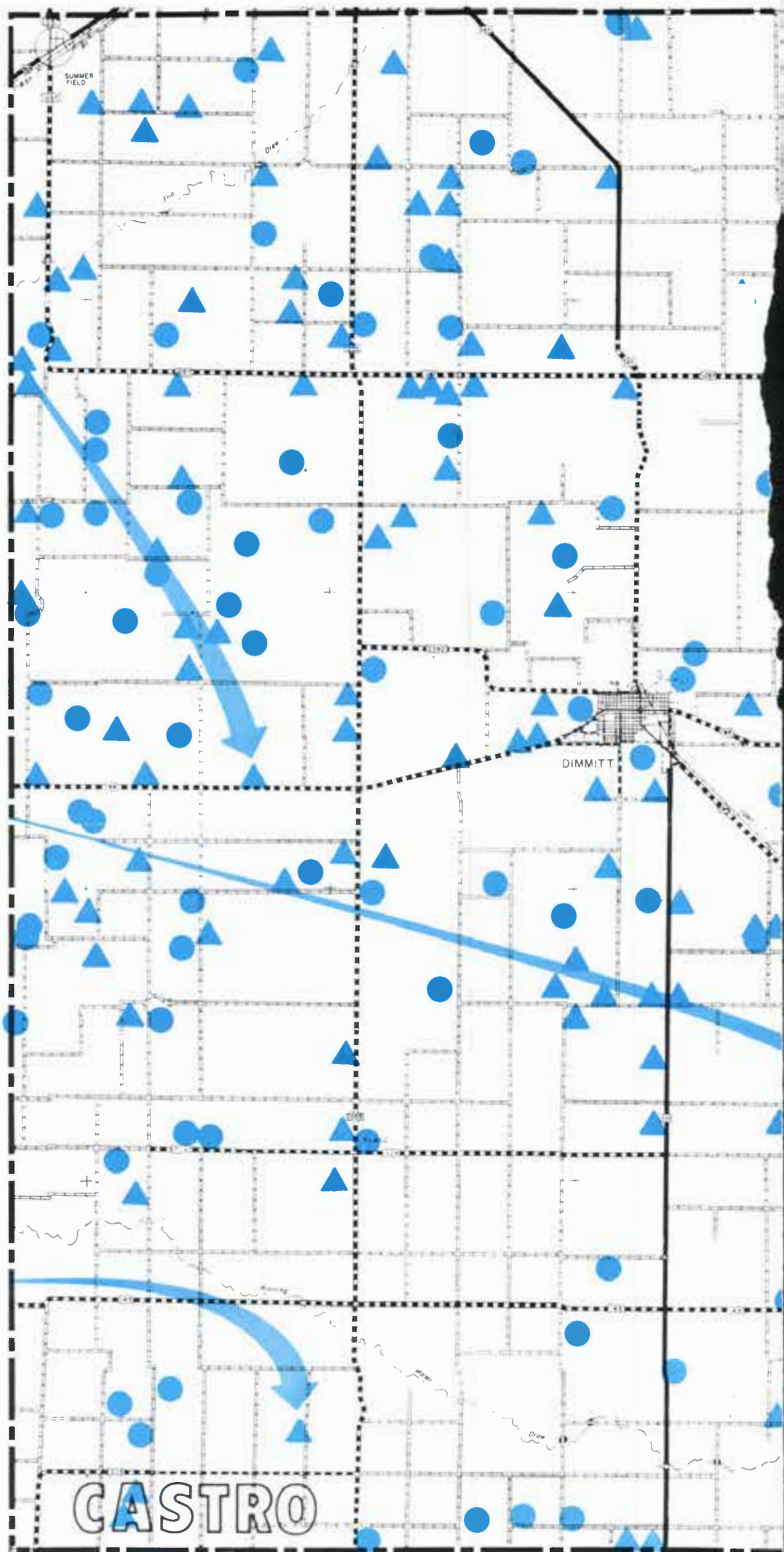
ROBERT L. HAWKINS

Mr. Hawkins, farmer and rancher, is able to water 50 acres the year round from his lake modification. He feels this modification is equal to another 8" irrigation well.



G. KELLAR

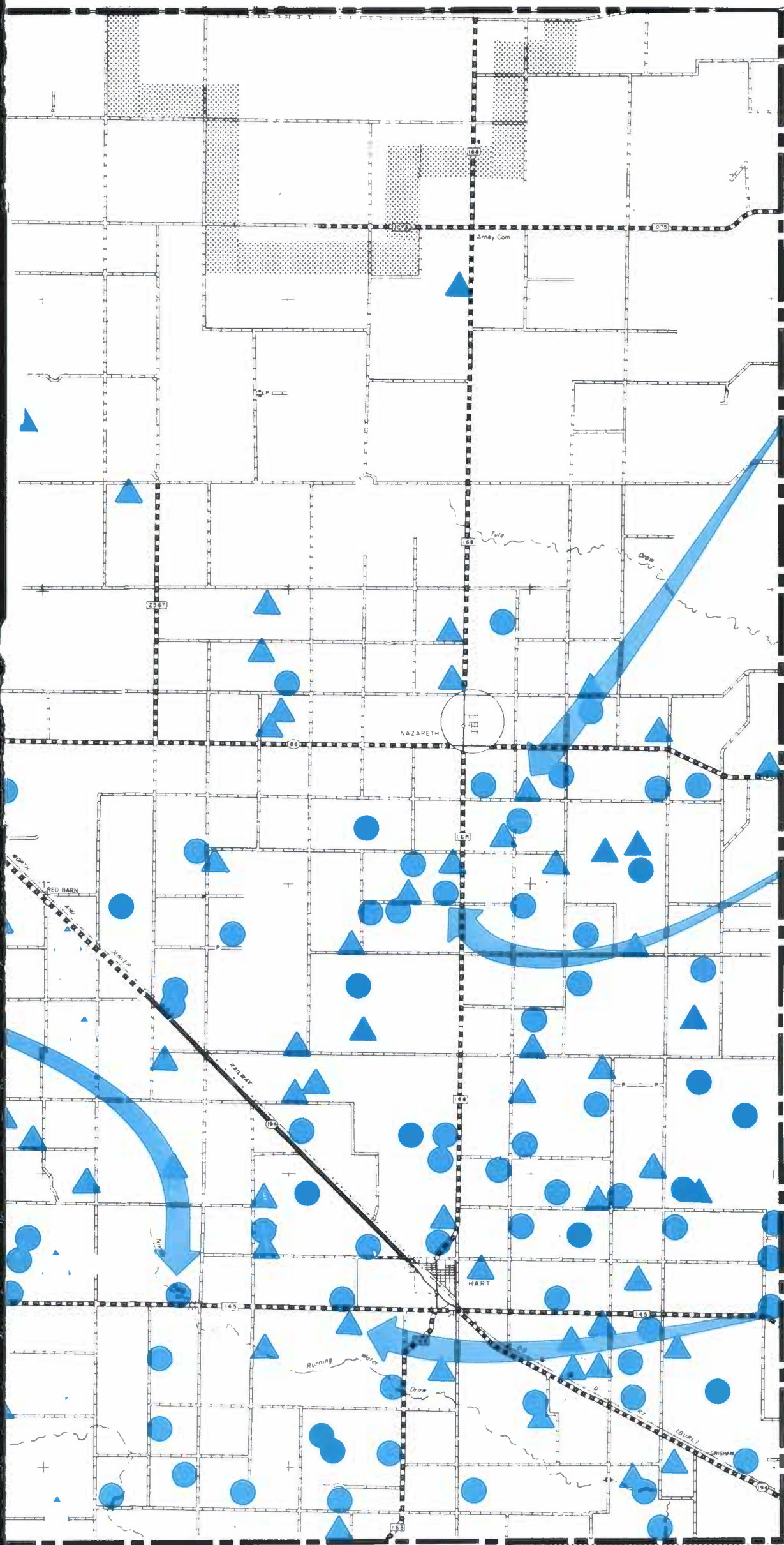
Mr. Kellar states that his return system is nearly equal to another 8" well.



TAILWATER AND PLAYA L

● PLAYA LAKE RECOVERY SYSTEMS





**LAKE RECOVERY SYSTEMS**  
 LEGEND  
 ▲ TAILWATER RECOVERY SYSTEMS



Left to right: KENNETH SEALES, District Field Representative and CHARLES HECK, JR.

Mr. Heck has found his tailwater pits and lake modification to be one of his most valuable investments. He has produced 9,300 pounds of maize per acre on 70 acres by using only tailwater.



ED RAMAEKERS AND FLORANCE J. ALBRACHT

Mr. Ramaekers and Mr. Albracht are able to drain their plays for the production of crops in the plays and can use the lake water for production of other crops.



GLENN WILLSON

Mr. Willson states that water running down the barditch is just like money running down the barditch.



# Water Crisis . . .

—continued from page 1

ing, urbanizing man has destroyed oxygen-producing vegetation over large continental areas.

However, enough plant life, the phytoplankton, remains in the oceans to keep the oxygen content of the atmosphere fairly stable at about 20 per cent. But man is polluting even the oceans, with what consequences he does not know.

In the solar system, at least, earth appears to be uniquely blessed with water in great quantities. Only in the case of Mars does there appear to be any faint possibility that another planet of the sun's family has or ever has had any liquid water at all.

On earth there is a prodigious amount of water—326 million cubic miles of it. Of this hard to conceive quantity, 317 million cubic miles are in the seas which cover 71 per cent of the globe.

Most of the rest consists of "frozen assets" of fresh water locked up in glaciers and the polar icecaps.

### Water Sports

Man, of course, is primarily concerned with available fresh water, the stuff he can drink or moisten his yards and crops with, or use in cooking, washing, and industry, or as a medium for harboring trout and other fish which it is fun to catch.

For recreation men do, of course, swarm to the sea beaches, and the estuaries, and release their tensions in many salt water sports—surf swimming and fishing, scuba diving, sailing, and lolling on the sand in the sun. They transport most of their goods in world commerce upon the salty oceans.

But the sea's great gifts to man is fresh water. The sun annually distills (evaporates) 80,000 cubic miles of fresh water from the oceans and 15,000 cubic miles from the land.

At all times about 95,000 cubic miles of water are moving between earth and sky. What goes up subsequently comes down. This, crudely put, is the hydrological, or water, cycle.

This water, as rain, snow, hail, or sleet comes down all over the world. Most of it falls back into the oceans. But a lot of it falls on the land. The United States gets about 30 inches a

year or 4.3 trillion gallons a day. Roughly 70 per cent of this is sent back up into the air as vapor. This includes the water used by plants.

It seems silly to talk of polluting the ocean. But it is happening. DDT has been found in marine creatures everywhere. And if the plant of the ocean is jeopardized, so is the oxygen supply on which all life depends.

The Torrey Canyon oil spill of 1967 and more recent ones, including the calamity off Santa Barbara, Calif., were disasters. Animal and bird life in the spoiled areas may never be the same. Perhaps, just perhaps, these calamities were strictly local.

In any event, they might have been worse, given man's capacity for unintentional destruction. Suppose the Torrey Canyon had been loaded not with oil but with herbicides.

Cole asks the question: Would photosynthesis, the process by which plants produce oxygen, have been wiped out in the North Sea?

A few such accidents could leave man gasping not in a matter of generations, Cole suggests, but in a matter of years.

An alarmist notion? Possibly. But those who have looked hardest at what man has done and is doing to his environment have come to expect the worst.

### Regional Shortages

Some authorities hold that for the United States, at least, there is no water crisis. Says the National Acad-

emy of Sciences, "there is no nationwide shortage and no imminent danger of one."

It goes on to say, however, that "there are serious regional shortages of usable water, many of which are becoming critical because of shortsighted planning or pollution of freshwater supplies."

Nace recently pleaded for preservation of a resource which he said is "perhaps the most valuable" humanity possesses. This is what the hydrologists call ground water. It has been stored by nature over the millennia in subterranean "aquifers" consisting of porous rock, gravel, sand, and sediments.

According to Nace, 97 per cent of all fresh liquid water on the continents is contained in aquifers which hold "many times more water than can be stored in all the surface reservoirs that will ever be built" by man. They are "buried treasure."

In arid regions they constitute the chief source of water. This nation, Nace said, need never run out of fresh water if it cooperates with nature to maintain its aquifers.

### Industrial Wastes

Ground water supplies are menaced in many ways. They can be killed by over pumping which results in subsidence and compaction of subsurface materials to the point where they become impervious and hence useless for water storage.

They also can be made unfit for use by pollution. Encroachment of salt water into pumped coastal aquifers is one source of pollution. Septic

tanks do their bit. Another source is the growing practice of underground disposal of industrial wastes.

One of man's new and weird pollutants is simply warm water. Most of the water taken by industry and cities from streams is used for cooling and then poured back.

According to scientists, many forms of aquatic animal and plant life are threatened by the great tonnage of heated water from power plants, nuclear or coal-fired, which is being spewed into rivers, lakes and coastal waters.

If the problem is one for the present, it is even more so for the future.

A study reported by the geological survey showed that in 60 of the undeveloped countries of Africa, Asia, and Latin American 90 per cent of the population depends on water supplies "that are inadequate or unsafe."

The shortage in all countries, according to Nace, is not of water but of waterworks to make the available water usable.

The United States, with tough regional water problems of its own, is trying to help less fortunate nations with theirs. In 1967 it created the office of Water for Peace in the State Department. This agency is concerned with a host of projects ranging in scope from provision of drinkable water on a local scale to large river-basin development programs.

As part of the Water for Peace endeavor the United States is spending about \$400 million a year in many countries to build waterworks designed to supply both household and industrial needs.

This is something that needed to be done. No nation can mature without an abundance of water. But does anybody imagine this or anything else projected will satisfy the needs of the seven billion human beings who will populate the earth by 2000 A. D. if current forecasts come true?

Nace is appalled by these population predictions in view of the inability of men "to control either nature or themselves."

"Imagine what the pollution load on water supplies could be with that many people around! Especially if the 'advanced' countries succeed in teaching the undeveloped ones all of their technologically ingenious ways for adding new and weird pollutants to the environment."

*NEXT: Coming to terms with nature.*

County	Permits Issued	New Wells Completed	Replacement Wells Drilled	Dry Holes
ARMSTRONG	0	0	0	0
BAILEY	15	24	0	2
CASTRO	26	47	2	2
COCHRAN	1	4	0	0
CROSBY	2	0	0	0
DEAF SMITH	50	47	2	3
FLOYD	17	25	1	0
HALE	5	3	0	0
HOCKLEY	5	11	2	0
LAMB	15	13	5	1
LUBBOCK	16	24	2	1
LYNN	0	0	0	0
PARMER	35	44	7	1
POTTER	3	3	0	0
RANDALL	14	17	0	1
<b>TOTALS</b>	<b>204</b>	<b>262</b>	<b>21</b>	<b>11</b>





A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 15—No. 17

"THERE IS NO SUBSTITUTE FOR WATER"

October, 1969

## RAYNER APPOINTED GENERAL MANAGER

Frank Rayner was appointed Manager of the High Plains Underground Water Conservation District No. 1 at the October meeting of the Board of Directors.

The District executed a three-year contract with Rayner, who has served as Acting Manager since August 7.

Rayner joined the District staff in August, 1966, as Chief Engineer. In addition to his new role as Manager, he will also continue to serve as the Chief Engineer.



REP. GEORGE MAHON

## Funds Authorized To Study Water Plan

Rep. George H. Mahon of Lubbock recently announced the House Appropriations Committee had approved \$1,005,000 to continue the study of moving surplus Mississippi River water into Texas and New Mexico.

In a closely related action, the committee also voted to appropriate \$500,000 to start a water availability study of the Lower Mississippi River. This new study, long planned but not undertaken is a necessary part of determining whether water from the Mississippi can be transported to West Texas and other dry areas.

The projects are strongly supported by Mahon who is chairman of the

—continued on page 4

## Water, Inc. Recognizes County Units

The Directors of Water, Inc., a non-profit organization dedicated to the importation of water to the High Plains area, have okayed bylaw changes giving official recognition to County Units and making it possible for County Units to attain full district status. The action came at a Board meeting October 3.

Eight County Units have already been formed in anticipation of the board action, and seven more are slated for organization within the immediate future. Units organized before the board action are in Cochran, Moore, Hartley, Hockley, Dawson, Howard, Sherman and Lynn counties. Slated for immediate organization are units in Terry, Hansford, Hutchinson, Potter, Ochiltree-Lipscomb, Garza and Gaines counties.

Citing the need for the "grassroots"

—continued on page 4

## New Action Foreseen In 1971 Legislature

Jack Fickessen, assistant director of the Texas Water Development Board, predicted that the 1971 legislature would resubmit a proposal for financing the Texas Water Plan.

Texas voters defeated the constitutional amendment to finance the plan last August.

Fickessen believes the defeat of the amendment was due primarily to mis-

—continued on page 4



REP. BILL CLAYTON

## Texas Water Study Committee Named

House Speaker Gus Mutscher recently named three House members to serve on an interim study committee on water and reevaluate the Texas Water Plan.

He picked Reps. Bill Clayton of Springlake, John Allen of Longview and Rex Braun of Houston. Three senators and three private citizens will be named by Lt. Gov. Ben Barnes and Gov. Preston Smith to serve on the panel.

Mutscher said the committee will try to determine how to define the

—continued on page 4

## Water Import Study On Schedule

Harry Burleigh of Austin, area engineer with the U. S. Bureau of Reclamation, told the Directors of Water, Inc., that the federal studies of a proposal to import water from the Mississippi River to Texas and New Mexico are on schedule and the preliminary studies would be completed and released in 1972.

The federal studies are being conducted by the U. S. Bureau of Reclamation, the Corps of Engineers, and the Mississippi River Commission. The Bureau of Reclamation is conducting a study of the feasibility of the Texas Water Plan, and the Corps of Engineers and the Mississippi River

—continued on page 4



OTHA DENT

## OTHA DENT HEADS WATER COMMISSION

Otha Dent, a 16-year veteran of the Texas Water Rights Commission, was appointed commission chairman recently.

Dent was named by Gov. Preston Smith to succeed Joe Carter, chairman since 1961. Carter remains a commission member.

The other commissioner is Leslie Neal, appointed by Smith earlier this year.

Dent is a former Lamb County judge at Littlefield and was once president of the Texas County Judges and Commissioners Association.

## LUBBOCK COUNTY CONSERVATION

Lubbock County farmers are trying to make full use of their existing water supply. One hundred and forty six lake modifications have been installed and are saving an estimated 9,782-acre feet of water a year. This water has an estimated value of \$391,280, and this does not include the

(See Map Page 2)

added benefits of warmer water and suspended trace elements. Thirteen tailwater pits have been installed and are saving an estimated 1,040 acre feet of water a year.

Lubbock County farmers have be-

come very water conservation conscious during the last few years. They realize the value of their water and are making every effort to extend the existing supply as long as possible.

Playa lakes and tailwater pits have been proven to be a good source of cheap water. Tests on playa lakes have proven the following advantages:

1. Utilization of lake water will either offer the farmer an additional supply of water — raising the potential income of the farming unit substantially, or else will prolong his irrigating economy by using this lake

—continued on page 4





**BILL BURGETT and RODNEY BURGETT**

Mr. Bill Burgett irrigated 50 acres of crop land three times during the past growing season.



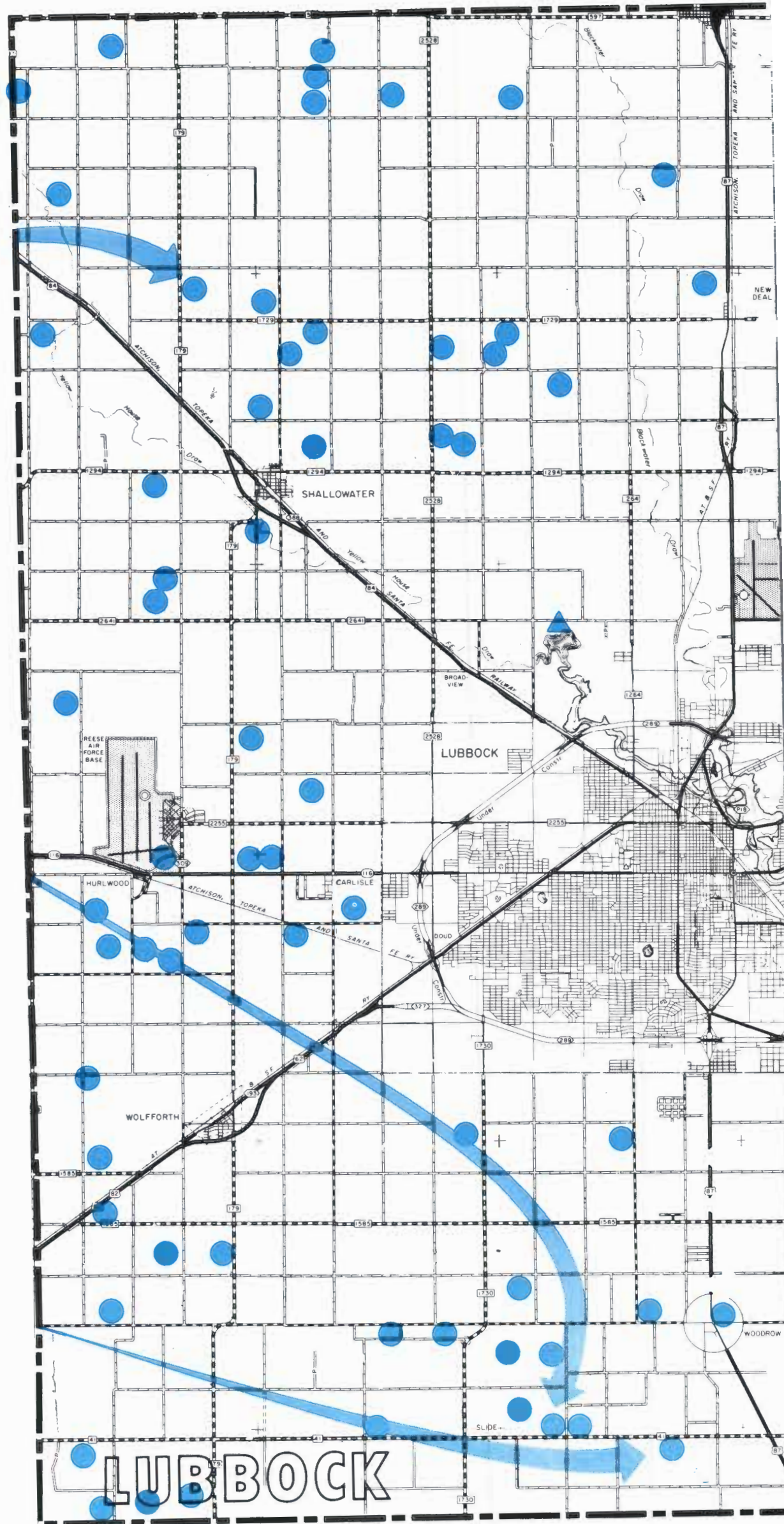
**JAMES SMITH and BOB SMITH**

Mr. James Smith is very proud of his lake modification, and states that the construction of his modification only cost \$200.00.



**OLAN K. DORSETT and OBBIE GOOLSBY, District Field Representative.**

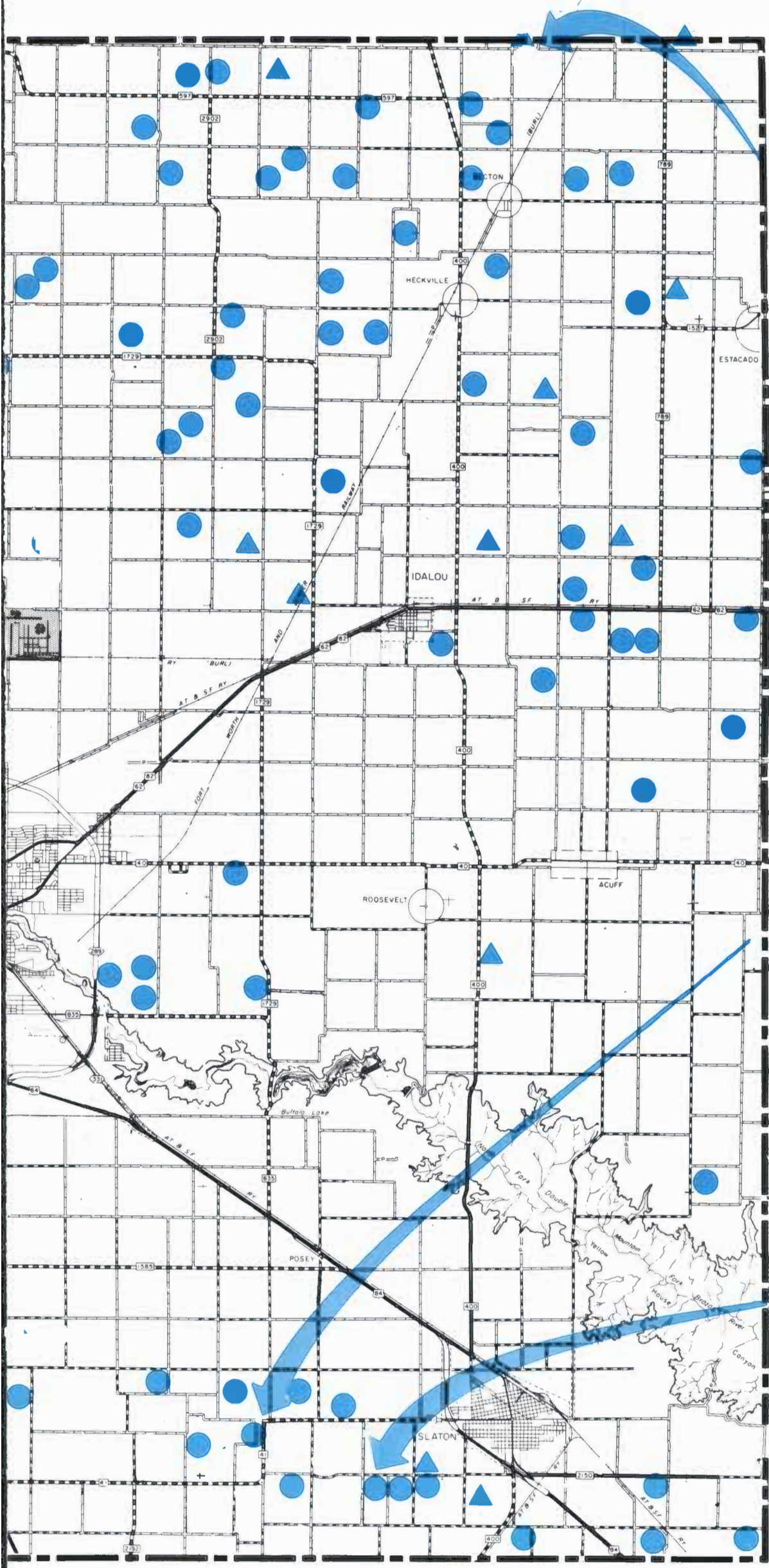
Mr. Dorsett has been pumping his playa since the early 50's, and he believes this is one of the best and cheapest sources of irrigation water.



**TAILWATER AND PLAYA L.**

● PLAYA LAKE RECOVERY SYSTEMS





HENRY KVETON and RUSSELL BEAN

Mr. Bean, who is the President of the Board of Directors of the High Plains Underground Water Conservation District No. 1 and a member of the Board of Directors of Water, Inc., believes that every effort must be made to make the maximum use of our existing water supply until such time as imported water becomes a reality.



CLARENCE KITTEN

Mr. Kitten feels that if we do not start saving our water now, we will not have any water to save.



R. C. SCHILLING

Mr. Schilling stated it was like getting 15 acres of land free when he modified his playa lake. He has not missed a crop on his playa land in 10 years; and the modification is equal to a 7" well.

KEY RECOVERY SYSTEMS  
 END  
 ▲ TAILWATER RECOVERY SYSTEMS



## County Units . . .

—continued from page 1

organizations, Tom Williams, Associate Director for Membership and Organization, said the county units will provide a sounding board for developing local needs and ideas, as well as serve as an effective tool for membership cultivation, membership and public education, and development of local support for the aims and goals of Water, Inc.

Each county unit is governed by a board of directors, elects its own officers, and conducts membership programs.

In setting the ground rules for the county units, it was provided that every member of the parent organization, Water, Inc., living within the unit's county would automatically be a member of the county unit.

A county unit will reach district status when at least 100 active members of Water, Inc. live within the county. Then, upon application, the unit will be designated as a district and entitled to elect a director to the Water, Inc. board.

## Texas Water Study . . .

—continued from page 1

goal of obtaining adequate water for Texas and how the objective can be developed and financed. Failure of a constitutional amendment to provide \$3.5 million in water development bonds August 5 did not mean Texans are unwilling to accept their responsibility to provide adequate water for the future, Mutscher said.

Mutscher said he expects the committee will seek alternate means for financing water needs and "take a detailed, close look at all the ramifications of the Texas Water Plan in relation to its benefits to each area of the state."

## Funds Authorized . . .

—continued from page 1

House Appropriations Committee.

The study of importing Mississippi water into Texas and New Mexico is being jointly made by the Bureau of Reclamation and Army Engineers. It was begun in 1966 and is scheduled to be completed in 1972.

If the report is favorable — finding

## Lubbock County . . .

—continued from page 1

water instead of the underground water which is being exhausted.

2. The pumping of water from playa lakes offers vast potential in salvaging valuable land for crop production.

3. Lake water which has been sampled has shown that this water contains between 3 and 15 tons of silt per acre foot. By utilizing lake water, this valuable top soil, some of which stays suspended in the lake water, can be redistributed back on the land from which it eroded.

4. Chemical analysis of lake water has shown that this water contains most of the major, minor, and trace elements which are necessary for the production of crops grown on the High Plains of Texas. Perhaps the most valuable chemical found in lake water is nitrate nitrogen; quantities exceeding 30 pounds per acre foot have been analyzed.

5. Temperatures made of the water pumped from the Ogallala formation average about 63° F, whereas water in playa lakes averages about 80° F from April through September. Most major crops grown on the Southern High Plains of Texas are greatly affected by soil temperatures. The warmer water pumped from playa lake water will not lower soil temperatures as greatly as the colder water pumped from the Ogallala formation and will not, therefore, retard growth.

6. Pumping the water from playa lakes and/or modification virtually eliminates the production of mosquitoes.

Advantages to a tailwater pit:

1. Prevents the ponding of water at the lower end of the field which interferes with plant development and causes reduced crop yields.

2. Prevents the flooding of adjoining neighbors' farmland thereby reducing the threat of legal action.

3. Prevents the flooding of public

it is feasible to transport the water — Congress will be asked to authorize the project. After that, appropriations for the construction can be considered.

roads and eliminates sources of accident.

4. Prevents the flooding of public road drainage ditches and reduces county expense for road maintenance and repairs.

5. Prevents mosquitoes from breeding by eliminating the shallow, tepid water necessary for mosquito breeding.

6. Provides an additional source of irrigation water, in some cases increasing it by as much as 20 to 25 percent.

7. Improves the efficiency of water distribution by allowing the farmer to use a larger head of water to get the water to the end of the rows quicker. This provides for a more uniform moisture penetration by eliminating deep moisture penetrations in the upper portion of the field, not enough moisture in the middle of the field and deep penetration at the lower portion of the field where ponding occurs.

8. Reduces the amount of irrigation labor necessary. Many farmers using recirculation systems state that one man can now irrigate as much as two or three men before the recirculation system was installed.

9. Recovers and reapplies nutrients carried from the farm in tailwater. Water District tests show that about 30 pounds of nitrogen in the form of nitrates were being lost per acre-foot of tailwater. The recirculation system salvaged these nutrients as well as the tailwater.

10. Recovers and reapplies rich top soil carried from the farm in tailwater. Water District tests show that on the average 9 to 10 tons of soils are carried off the farm in each acre-foot of tailwater.

11. Improved plant growth rate because tailwater is much warmer than ground water. Cold ground water causes a temporary cooling of the soil and reduces the rate of plant growth for a few days. The warm tailwater does not lower the soil temperature appreciably, and allows the plant to continue its normal growth rate.

12. Prevents waste and conserves the existing underground water supply and postpones the exhaustion of our underground water supply.

13. Prevents legal action that could close down your well.

## CALIFORNIA TOUR

A lot of interest and enthusiasm have been shown toward the prospects of a tour of water projects in California.

The trip is quite similar to the trip taken by several water leaders in late 1967.

Such a trip could be arranged in early 1970 if enough interest is shown.

The California projects are similar to proposals being made in the Texas Water Plan, and a trip to the area gives visitors a first-hand look at a functioning system.

Cost for such a trip would be in the range of \$300.00 per person.

## Water Import Study . . .

—continued from page 1

Commission will determine the extent of surplus water available for importation. The Bureau is also working on plans for a distribution system to deliver import water from terminal reservoirs to farms, cities, and industries.

Burleigh revealed that the Bureau is conducting continuing conferences with the 11 major power companies operating in the area to be served by the Texas Water Plan. He said the 11 companies have agreed to furnish power needed to operate the system. Burleigh said that although huge quantities of electrical power will be needed, it will, in fact, amount to only about two percent of the total power being used within the served area in 1990.

## New Action . . .

—continued from page 1

understanding and lack of understanding.

"Financing and passage of a joint federal-state project must be carried out by 1974 to meet the needs of the year 2020," he said.

"The Plan would cost an estimated \$9 billion, with the State's share \$3 billion to \$3.5 billion. Actually, the cost is peanuts compared to money spent on highways and education throughout the State," he said.

Fickissen spoke to delegates of the American Water Resources Association in conjunction with the 14th Annual Water for Texas Conference meeting in San Antonio.





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Volume 15—No. 18

"THERE IS NO SUBSTITUTE FOR WATER"

November, 1969



## AIR FORCE BASE CONSERVES WATER

Reese Air Force officials have developed a unique water conservation program. They are dumping their sewage effluent into a lake and using this mixture of lake water and sewage effluent to maintain their golf course.

Lt. Colonel Buckberry, base engineer, said, "We are able to save \$14,000.00 a year by using the water from the effluent lake."

The training base, which is located 10 miles west of Lubbock, dumps approximately 300,000 gallons of sewage effluent a day into a 22-acre lake. The lake catches runoff water from the base and several hundred surrounding acres.

The Air Force maintains its own

wells and has produced its water for many years. During the last few years the wells have become weak due to the lowering of the underground water table and it is now necessary for them to purchase water from the city of Lubbock.

Capt. Bill Hubbard, information officer, said, "At one time the effluent lake was considered to be a waste of space and did not have any value, but during the last year it has proven to be very valuable."

A vote of thanks should go to the Air Force for what they are doing to conserve the supply of underground water.

## SUN OIL COMPANY vs. WHITAKER



MR. ERNEST WHITAKER

Recent developments in the case of *Sun Oil Company vs. Whitaker* have resulted in the transfer of the appeal of this case from the Amarillo Court of Civil Appeals to the Court of Civil Appeals at Eastland, Texas. It will be recalled that in this suit Sun Oil Company sought to enjoin Mr. Ernest Whitaker of Hockley County from interfering with Sun's production and use of Ogallala water for water flood purposes. Mr. Whitaker filed a Cross-Action seeking to enjoin Sun Oil Company from using Ogallala water for water flood purposes and to re-

—Continued on Page 2

## 5 Plains States Talk Of Protecting Water

The decision to attempt to tie five states together in an interstate water compact, and numerous other unofficial conclusions about preserving the "life blood" of the High Plains—water—came out of a recent day-long meeting in Goodwell, Okla. of irrigators, oilmen and government officials.

Conference chairman Robert C. "Bob" Lang of Ardmore, who heads the Oklahoma Water Resources Board, took informal authorization from the 200 delegates at Panhandle State College to make plans to join his state with Texas, Kansas, New Mexico and Colorado in a water commission.

The conference, packed into

Hughes-Strong Hall on the PSC campus, was the eight-hour product of a longtime controversy between irrigators who depend on the Ogallala formation for fresh water and oilmen who inject brine into the underlying Glorieta formation.

The irrigators used the conference to express fears that salt water pumped into the Glorieta will pollute their fresh water.

Oilmen testified as to their safeguards against pollution.

"I've got the ideal job," Sam Shakeley of the Oklahoma Corporation Commission (OCC) said during the meeting. Except every time the

—continued on page 4

## Ellis L. Armstrong Receives Appointment

Appointment of Ellis L. Armstrong, 55, of Salt Lake City, Utah, as Commissioner of Reclamation was announced recently by President Nixon.

Armstrong has been assistant regional director of the Bureau of Reclamation since May 1968 with headquarters in Salt Lake City. From 1936 to 1954 he served with the Bureau on the design and construction of water development projects. As assistant regional director of the Bureau, Armstrong has supervised its programs and areas comprising Utah and parts of Nevada, Wyoming, Colorado and Arizona.

He succeeds Floyd E. Dominy who has served as Commissioner of Reclamation since 1959. Dominy announced in May 1969 that he planned to retire from Federal service.

Armstrong has been a consulting engineer, president of the Better Highways Information Foundation, Commissioner of Public Roads with the Department of Commerce (1958-1961), Director of Highways in Utah, and construction manager for the United States portion of \$700 million St. Lawrence Power and Seaway Project.

"Mr. Armstrong's solid background of administrative and engineering experience over 33 years, including 20 years with the Bureau of Reclamation

—continued on page 4

## WATER, INC. AWARDS GRANT

The Board of Directors of Water, Inc. recently awarded up to \$3,000 to Dr. George A. Whetstone, Professor of Civil Engineering at Texas Tech, to continue his studies on importation of water through the summer of 1971.

Dr. Whetstone is presently putting the final touches on a bibliography containing over a thousand abstracts of articles which have appeared throughout the world on interbasin diversion of water. The volume will be published as a Report of the Texas Water Development Board in early 1970. This project was financed in the summers of 1968 and 1969 by the Water Resources Center of Texas Tech, of which Dr. Dan M. Wells is director.

It is Dr. Whetstone's conviction that many of the complex engineering, financial, legal and political problems which Texas will encounter in the bringing of water to the High Plains have had their counterparts in smaller-scale projects. Much thought has been expended already on the ramifications of water transfer. The publications resulting from such studies are scattered throughout the literature of civil and agricultural engineering, law, geography, economics and other fields. By collecting and digesting these papers and publishing the abstracts he is making this background

—continued on page 4





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**COUNTY COMITTEEMEN**

**Armstrong County**

Foster Parker, 1970 \_\_\_\_\_ Rt. 1, Happy  
Guy Watson, 1971 \_\_\_\_\_ Wayside  
James Bible, 1970 \_\_\_\_\_ Wayside  
Carroll Rogers, 1972 \_\_\_\_\_ Wayside

**Bailey County**

Mrs. Darlene Henry  
High Plains Water District  
Box 563, Muleshoe  
Lloyd Throckmorton, 1971 \_\_\_\_\_ Box 115, Muleshoe  
Ernest Ramm, 1970 \_\_\_\_\_ Rt. 2, Muleshoe  
W. L. Welch, 1970 \_\_\_\_\_ Star Rt., Maple  
R. L. Davis, 1971 \_\_\_\_\_ Box 61, Maple  
Jessie Ray Carter, 1972 \_\_\_\_\_ Rt. 5, Muleshoe  
Committee meets last Friday of each month at 2:30 p.m., 217 Avenue B, Muleshoe, Texas.

**Castro County**

E. B. Noble  
City Hall, Dimmitt, Texas  
Dale Maxwell, 1970 \_\_\_\_\_ Hiway 385, Dimmitt  
Frank Wise, 1970 \_\_\_\_\_ 716 W. Grant, Dimmitt  
Donald Wright, 1971 \_\_\_\_\_ Box 65, Dimmitt  
Morgan Dennis, 1971 \_\_\_\_\_ Star Rt., Hereford  
John Gilbreath, 1972 \_\_\_\_\_ Rt. 2, Hart  
Committee meets on the last Saturday of each month at 10:00 a.m., City Hall, Dimmitt, Texas.

**Cochran County**

W. M. Butler Jr.  
Western Abstract Co., Morton, Texas  
Ronald Coleman, 1971 \_\_\_\_\_ Rt. 1, Morton  
D. A. Ramsey, 1970 \_\_\_\_\_ Star Rt. 2, Morton  
Hugh Hansen, 1970 \_\_\_\_\_ Rt. 2, Morton  
Don Keith, 1971 \_\_\_\_\_ Rt. 1, Morton  
Keith Kennedy, 1972 \_\_\_\_\_ Star Rt. 2, Morton  
Committee meets on the second Wednesday of each month at 8:00 p.m., Western Abstract Co., Morton, Texas.

**Crosby County**

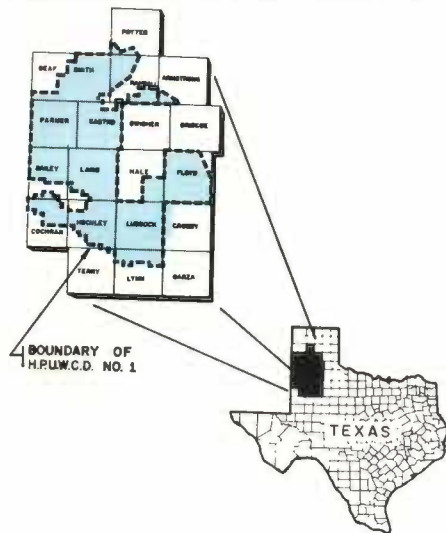
Sue Gray  
Lorenzo Pump Company  
W. O. Cherry, 1971 \_\_\_\_\_ Lorenzo  
M. T. Darden, 1971 \_\_\_\_\_ Lorenzo  
E. B. Fullingim, 1971 \_\_\_\_\_ Lorenzo  
Jack Bowman, 1970 \_\_\_\_\_ Lorenzo  
Kenneth Gray, 1970 \_\_\_\_\_ Lorenzo  
Committee meeting on the first Monday of each month at 1:30 p.m., Lorenzo Pump Co., Lorenzo, Texas.

**Deaf Smith County**

B. F. Cain, 2nd Floor  
County Court House, Hereford, Texas  
Billy Wayne Sisson, 1971 \_\_\_\_\_ Rt. 5, Hereford  
Frank Zinser, 1970 \_\_\_\_\_ Rt. 5, Hereford  
L. B. Wortham, 1970 \_\_\_\_\_ Rt. 3, Hereford  
Harry Fuqua, 1971 \_\_\_\_\_ Rt. 1, Hereford  
W. L. Davis, Jr., 1972 \_\_\_\_\_ Hereford  
Committee meets the first Monday of each month at 7:30 p.m., High Plains Water District office, Hereford, Texas.

**Floyd County**

Gayle Baucum  
101 South Wall Street, Floydada, Texas  
Pat Frizzell, 1970 \_\_\_\_\_ Box 1046, Lockney  
Tate Jones, 1970 \_\_\_\_\_ Rt. 4, Floydada  
M. M. Julian, 1971 \_\_\_\_\_ Box 65, South Plains  
M. J. McNeill, 1971 \_\_\_\_\_ 833 W. Tenn., Floydada  
Melvin Jarboe, 1972 \_\_\_\_\_ Rt. 4, Floydada  
Committee meets on the first Tuesday of each month at 10:00 a.m., Farm Bureau Office, Floydada, Texas.



**Hale County**

J. B. Mayo  
1617 Main, Petersburg, Texas  
Charles Schuler, 1970 \_\_\_\_\_ Petersburg  
Don Hegl, 1970 \_\_\_\_\_ Box 160 A, Petersburg  
Harold D. Rhodes, 1971 \_\_\_\_\_ Box 100, Petersburg  
J. C. Alford, 1971 \_\_\_\_\_ Box 28, Petersburg  
W. D. Scarborough, Jr., 1972 \_\_\_\_\_ Petersburg  
Committee meets first Monday each month at Water District office in Petersburg.

**Hockley County**

Murry C. Stewart  
208 College, Levelland, Texas  
Ewel Exum, 1971 \_\_\_\_\_ Rt. 1, Ropesville  
J. E. Wade, 1970 \_\_\_\_\_ Rt. 2, Littlefield  
Jimmy Price, 1970 \_\_\_\_\_ Rt. 3, Levelland  
H. R. Phillips, 1971 \_\_\_\_\_ Rt. 4, Levelland  
Bryan Daniel, 1972 \_\_\_\_\_ N. Sherman, Levelland  
Committee meets first and third Fridays of each month at 1:30 p.m., 917 Austin St., Levelland, Texas.

**Lamb County**

Calvin Price  
620 Hall Avenue, Littlefield, Texas  
Gene Templeton, 1971 \_\_\_\_\_ Star Rt. 1, Earth  
Jack Thomas, 1970 \_\_\_\_\_ Box 13, Olton  
Lee Roy Fisher, 1970 \_\_\_\_\_ Box 344, Sudan  
Artis Barton, 1971 \_\_\_\_\_ Hiway 70, Earth  
W. W. Thompson, 1972 \_\_\_\_\_ Spade  
Committee meets the first Thursday of each month at 8:00 p.m., Crescent House Restaurant, Littlefield.

**Lubbock County**

1628 15th Street, Lubbock, Texas  
Glenn Blackmon, 1971 \_\_\_\_\_ Rt. 1, Shallowater  
R. F. (Bob) Cook, 1970 \_\_\_\_\_ 804 6th St., Idalou  
Bill Dorman, 1970 \_\_\_\_\_ 1910 Ave. E, Lubbock  
Andrew (Buddy) Turnbow, 1971 \_\_\_\_\_ Rt. 5, Lubbock  
Alex Bednarz, 1972 \_\_\_\_\_ Rt. 1, Slaton  
Committee meets on the first and third Mondays of each month at 1:30 p.m., 1628 15th St., Lubbock, Texas.

**Lynn County**

1628 15th Street, Lubbock, Texas  
Roy Lynn Kahlich, 1970 \_\_\_\_\_ Wilson  
Roger Blakney, 1970 \_\_\_\_\_ Rt. 1, Wilson  
Reuben Sander, 1971 \_\_\_\_\_ Rt. 1, Slaton  
O. R. Phifer, Jr., 1971 \_\_\_\_\_ New Home  
Dale Zant, 1972 \_\_\_\_\_ Rt. 1, Wilson  
Committee meets the third Tuesday of each month at 10:00 a.m., 1628 15th Street, Lubbock, Texas.

**Parmer County**

Aubrey Brock  
Wilson & Brock Insurance Co., Bovina, Texas  
Guy Latta, 1971 \_\_\_\_\_ Friona  
Henry Ivy, 1970 \_\_\_\_\_ Rt. 1, Friona  
Jim Ray Daniel, 1970 \_\_\_\_\_ Friona  
Edwin Lide, 1971 \_\_\_\_\_ Rt. D, Bovina  
Webb Gober, 1972 \_\_\_\_\_ RFD, Farwell  
Committee meets on the first Thursday of each month at 8:00 p.m., Wilson & Brock Insurance Agency, Bovina, Texas.

**Potter County**

Fritz Meneke, 1970 \_\_\_\_\_ Rt. 1, Box 538, Amarillo  
Jim Line, 1971 \_\_\_\_\_ Bushland  
Vic Plunk, 1970 \_\_\_\_\_ Rt. 1, Amarillo  
Temple Rodgers, 1971 \_\_\_\_\_ Rt. 1, Amarillo  
F. G. Collard, 1972 \_\_\_\_\_ Rt. 1, Amarillo

**Randall County**

Louise Knox  
Randall County Farm Bureau Office, Canyon  
R. B. Gist, Jr., 1971 \_\_\_\_\_ Rt. 3, Box 43, Canyon  
Carl Hartman, Jr., 1971 \_\_\_\_\_ Rt. 1, Canyon  
Marshall Rockwell, 1970 \_\_\_\_\_ Canyon  
Richard Friemel, 1970 \_\_\_\_\_ Rt. 1, Canyon  
Leonard Batcherst, 1972 \_\_\_\_\_ Rt. 1, Canyon  
Committee meets on the first Monday of each month at 8:00 p.m., 1710 5th Ave., Canyon, Texas.

Sun Oil . . .

—continued from page 1

cover damages for water produced by Sun Oil Company from Mr. Whitaker's land.

Following a jury trial in January of 1969, Judge Ledbetter entered a judgment in favor of Mr. Whitaker. This judgment, which was entered on April 30, 1969, provided that Sun Oil Company be permanently enjoined from producing fresh subterranean water from Mr. Whitaker's land and using this water for oil and gas water flood, pressure maintenance and/or secondary recovery purposes. The judgment further provided that Ernest Whitaker recover damages in the amount of \$12,598.03. Sun Oil Company's request for an injunction was denied.

Sun Oil Company has perfected an appeal from this judgment to the Court of Civil Appeals in Amarillo. Notice was received on October 15 that the appeal was transferred by the Order of the Texas Supreme Court to the Court of Civil Appeals at Eastland, Texas.

*Sun Oil Company had contended that it had the right to use fresh water for water flooding purposes by reason of the free wood and water clause in its oil and gas lease.* Mr. Whitaker contended that the oil and gas lease owned by Sun did not authorize the use of water for secondary recovery purposes and that the parties to the lease did not intend for Sun Oil Company to use such quantities of fresh water as would materially affect the supply of fresh water which Mr. Whitaker could produce.

Mr. Whitaker further contended that the proposed use of fresh water by Sun Oil Company for water flood purposes would substantially devalue the farm owned by Mr. Whitaker. The decision of the Appellate Court in this case will be of much importance to landowners who own land which is leased by oil and gas companies.

This is the second appeal in this case. Sun Oil Company previously appealed from a decision by Judge Ledbetter denying its request for a

WATER INJECTION PERMIT SOUGHT

Pan American Petroleum Corp. has requested permission from the Railroad Commission to inject water into the Clearfork limestone under its Anton-Irish (Clearfork) Unit, Anton-Irish Field, Hale, Lamb, and Lubbock counties.

The reservoir, discovered in 1944, had a cumulative production of 48,708,452 barrels as of September 1. There are 181 producing wells in the project area, making an average of 49 barrels per day each.

Estimated additional oil to be recovered by injection is of a volume equivalent to primary production.

Proposed injection wells are the Anton-Irish (Clearfork) Unit Nos. 144 and 183.

temporary injunction. The Trial Court's decision in the earlier appeal was affirmed by the Texas Supreme Court, but in that appeal the Texas Supreme Court did not decide the question of whether or not the parties to the oil and gas lease involved in this suit intended that Sun Oil Company should have free use of water from the Ogallala Formation for water flood, pressure maintenance purposes.

While the High Plains Underground Water Conservation District No. 1 was a party to the previous appeal, the District is no longer involved in the suit as a participant. Prior to the trial of the case on its merits in January, Sun Oil Company amended its pleadings seeking an injunction against Mr. Whitaker only insofar as he might interfere with a well equipped to produce less than 100,000 gallons per day. Thereafter, the High Plains Water District withdrew as a party to the suit since such a well is below and outside the jurisdiction of the District.

No hearing date has yet been set before the Eastland Court of Civil Appeals. *Cross-Section* readers will be kept advised of future developments in this case.

DRILLING STATISTICS FOR SEPTEMBER AND OCTOBER

County	Permits Issued	New Wells Completed	Replacements Wells Drilled	Dry Holes
ARMSTRONG	0	0	0	0
BAILEY	0	5	1	0
CASTRO	10	13	2	1
COCHRAN	0	2	0	0
CROSBY	1	3	0	0
DEAF SMITH	19	14	1	1
FLOYD	8	10	2	0
HALE	1	6	0	0
HOCKLEY	2	2	0	0
LAMB	3	5	3	0
LUBBOCK	8	12	1	0
LYNN	1	1	0	0
PARMER	8	11	1	1
POTTER	0	2	0	0
RANDALL	6	4	0	0
<b>TOTALS</b>	<b>67</b>	<b>90</b>	<b>11</b>	<b>3</b>



## Water Plan Hurdle Remains: How To Get Funds

Texas officials and legislators are about to get over their shock at the defeat of the Texas water bond amendment Aug. 5. However, they still don't know what to do about it.

Water authorities, state and federal, are urging action soon.

"We've got a lot cut out to do," says Rep. Bill Clayton of Springlake, head of the special legislator-layman study committee of nine that is just now being appointed. It still has to organize, decide what it wants to do, hold public hearings, make its findings and recommend what should be done to the 1971 legislature.

The same legislature that authorized the study committee after defeat of the proposed amendment for the \$3.5 billion bond issue, by 6,277 votes, also gave the Texas Water Development Board an extra \$1 million to continue planning future projects.

But the mammoth Texas water plan, covering water needs for 50 years, is fast reaching the point where Texas must stop talking and start spending money.

"Some plan of financing will have

to be provided if we are to implement the Texas water plan and provide the water Texas will need tomorrow and the next century," Jack Fickessen, assistant director of the Texas Water Development Board, told a San Antonio meeting of water experts. He predicted the 1971 legislature will re-submit some form of financing to voters.

Clayton said his committee certainly will investigate alternative means of financing, since voters showed such reluctance to one big bond issue.

"Perhaps a dedicated water user tax or a one mil dedication of the sales tax," he said, "or submitting several bond issues to voters, in increments, instead of hitting them once for a huge bonding authority."

He said the committee might also decide to recommend that the big bond issue be kept intact but write in such restrictions as making it contingent on a "determinable surplus" from the Mississippi River or putting in a provision spelling out that water users would be responsible for repaying the bonds.



Mr. Whitaker standing by Sun Oil Co.'s water flood source well on his land.



Frank Rayner, Manager of the High Plains Underground Water Conservation District No. 1, and Lt. Colonel M. S. Buckberry, Base Engineer, discuss how Reese Air Force Base is saving \$14,000 a year by pumping their sewage effluent into a playa lake and using this mixture of water for construction purposes and golf course maintenance.



Mr. Whitaker surveys unproductive land in area of water flood source well.



Golfers using effluent irrigated green.



Sun Oil Company tank batteries.



## Plains States . . .

—continued from page 1

phone rings—somebody's mad. If it's not the irrigators mad about the oil companies, it's the other way around.

"But it's time to get excited. We should have done this (confer) 30 years ago."

Virgil Higgins of Guymon, a Texas County irrigator who seemed to speak for most of those involved, talked of his fellow irrigation farmers and their several campaigns to draw attention to the topic. Many of the projects, including a letter-writing campaign, extended nationwide and prompted a study by the U.S. Geological Survey.

"We think we're fighting for our lives," Higgins said. "This pumping back of salt water is a luxury and convenience we may eventually regret. It could even make the salt water unfit for desalinization."

"We are not opposed to the OCC or the oil industries, and we're not opposed to underground disposal of salt water, as long as we can be sure it will not pollute fresh water. We can't furnish proof of pollution, but when we prove it, it will already be too late."

Lang told the delegates the OCC had granted a moratorium on all disposal permit approvals until after the conference.

Among the farmers who spoke, J. L. Davis of Goodwell said, "We have no right to gamble with water." Another said he had had an experience with "contaminated water on his own place. "It just tasted muddy until they go down so far, then that pickle juice taste came out."

Commissioner Shakeley said, "We could not find a better salt water disposal zone than the Glorieta. There is no threat of pollution now, and we'll work to assure none in the future."

Reports from Fred Osborn on the Texas Water Development Board and Doug Rogers, director of the Colorado Oil and Gas Commission, indicated the main pollution scare lies closer to the Oklahoma Panhandle than anywhere else.

Osborn said, "There is no problem indicated anywhere in Texas but any disposal is dangerous if caution is not used. Re-pumping salt water is better than letting it sit out and drain off."

James McCredie, a Mobil Oil Corp. executive, listed casings and cementings on the injection wells as main safeguards against the salt water's backing up into freshwater formations. "We bring the cement above the producing zone and pack it to confine the salt water to its own formation," he said.

Irrigator Higgins quoted from several publications, drawing from them quotes about "improperly abandoned (salt water) holes" and "many unknown factors" that affect saline fluids in the ground. He said, "This is a grim picture, but we hope it's a bit exaggerated. Now is the time to continue the survey and check out the old wells and the new."

James H. Irwin and Robert B. Morton, U.S. Geological Survey representatives who have studied this area, presented a joint explanatory report. Morton emphasized the "possible vertical movement" of salt water in the formations.

The meeting of salt water with fresh, Morton said, depends on two factors: the surface to which salt water will rise because of internal pressure, and the presence of conduits, natural or artificial, on which salt water can travel upwards.

As to the first factor, Morton said there have been no pressure surveys made on the Glorieta. For the conduits, he said, "There are numerous boreholes in the area. If they were badly made or have deteriorated, they may serve as conduits. The U.S. Geological Survey does not know of any boreholes like this."

"Our weak point," Irwin said, "is some non-accurate studies of the Glorieta. There are some questions we cannot answer."

Morton, pointing out several charts on the auditorium stage, showed that the thickness of mostly low-permeability rock between the Ogallala and the Glorieta varies from state to state. Separating rock, he said, is 800-1,000 feet thick in Kansas, 600-700 feet in the Texas Panhandle and 500-1,600 feet in Oklahoma.

In the event of proven contamination, Morton said, "It wouldn't take salt-water pumping by oil companies for the Glorieta to ruin the Ogallala, if the piezometric level (how high the salt water can rise over its own bed) were high enough."

Oklahoma State Rep. John "Happy" Camp of Waukomis, who sug-

## WILBARGER OIL SUIT UPHELD

A Wilbarger County family waited too long to sue oil operators for allowing salt water to seep into the family's wells, the Texas State Supreme Court ruled recently.

The court said it could find no reversible error in lower court decisions.

A Wilbarger County jury and a court of civil appeals both held the two-year statute of limitations had run out by the time Charlie Matysek and Charlie Joe Matysek filed suit against Tom B. Medders and others who operated an oil and gas lease.

The lease covered the Matysek property and a neighboring tract. The Matyseks claimed the oil operators maintained a salt water pit that leaked into an underground water formation and polluted both a house well and an irrigation well. They filed suit in 1967.

*The courts held the Matyseks were fully aware of the pollution in September 1964, when they first discovered a salty taste in their household water supply.*

gusted the interstate water compact at the outset of the meeting said the irrigation industry "has made the Panhandle the most vigorous and fastest-growing section of Oklahoma." He suggested the delegates tour the cropland and oil land to "get off the highways and see what's happening here."

"These irrigators have been mighty vociferous to the regulators," Chairman Lang said during the noon lunch break. "They've got a real, honest fear, and they've complained to my water board, their corporation commissions, even to the fish and wildlife people."

## Armstrong . . .

—continued from page 1

uniquely qualifies him to direct one of this Department's most important missions — providing sound water development programs for the western states," Secretary Hickel said.

Armstrong graduated from Utah State University with a B.S. degree in civil engineering and carried on advanced studies at Utah State and Colorado State Universities. He has an honorary doctor of engineering degree from the Newark College of Engineering and in 1958 was named the national honor member of Chi Epsilon, the national civil engineering honor fraternity.

## Water, Inc. . . .

—continued from page 1

available to other Texans.

In addition to the preparation of the annotated bibliography, Dr. Whetstone has presented a number of papers and published extensively on water import in the past year.

His plans for use of the WATER, INC. grant include the preparation of a second volume of the bibliography. "I am aware of the existence of many papers which were not included in the first volume, and the flow is augmenting," he has stated.

**Water Is Your  
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EDITOR  
THE CROSS SECTION  
1628 15th Street  
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A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 15—No. 19

"THERE IS NO SUBSTITUTE FOR WATER"

December, 1969

## WATER LEVELS TO BE MEASURED IN JANUARY

Personnel of the High Plains Underground Water Conservation District No. 1 and the Texas Water Development Board will be measuring the depth to water in over 800 observation wells within the boundaries of the High Plains Underground Water Conservation District during January 1970.

These measurements will constitute the continuation of an annual depth-to-water-measurement program that was initiated by the U.S. Geological

—continued on page 3



Mr. Obbie Goolsby, a field representative for the High Plains Underground Water Conservation District No. 1, measuring a typical observation well.

## HIGH PLAINS WATER DISTRICT ELECTION TIME

The annual election for the High Plains Underground Water Conservation District No. 1 will be held January 13, 1970. Voters will vote for nominees for District Directors and County Committeemen.

At the end of this year, three of the five men who serve as members of the Board of Directors will conclude their present terms of office. These three are, Russell Bean, who represents Crosby, Lubbock, and Lynn Counties; Chester Mitchell of Lockney, who represents Floyd and Hale Counties; and Weldon Newsom of Morton, who represents Hockley, Cochran, and Lamb Counties.

The ballot will also include the nominees to fill places for each five-man County Committee in the District. Each county in the District has a "County Committee" that approves

PROGRAM STREAMLINED

## Tax Guideline Maps Released

by F. A. RAYNER

The first set of the cost-in-water-depletion, income-tax-allowance guideline maps for Precinct 3, Crosby County (Lorenzo), were released on December 15, 1969.

These guidelines consist of saturated thickness (thickness of the water bearing zone in the subsurface) maps for 1938, 1958, and 1968; and maps showing the amount of the depletion (decline or reduction in thickness) of the saturated interval for the years 1966, 1967, 1968, and 1969. The three saturated thickness maps were printed on one sheet. The four decline maps were also printed on one sheet.

The Crosby County decline guideline maps for the years 1962, 1963, 1964, and 1965 (printed on one sheet) are to be released on January 6, 1970.

The 1969 decline guideline maps for the other counties in the District—Armstrong, Bailey, Castro, Cochran, Deaf Smith, Floyd, Hale, Hockley, Lamb, Lubbock, Lynn, Parmer, Potter, and Randall—are to be released on January 5, 1970.

On December 12, 1969, the Board of Directors authorized a price increase from \$0.50 to \$1.00 per map, plus postage. This increase was nec-

well drilling permits and makes recommendations on various matters to the District Board.

A qualified voter is one who has a valid Voter Registration Certificate for 1969, and resides within the District. Voters can cast their ballot for the candidate of their choice for District Director or County Committeeman-at-large at any polling place in the county in which they reside. Voters residing in the precinct for which a County Committeeman is being chosen can only vote for the Committeeman of their choice of that precinct by casting their ballot at the polling place provided in that precinct.

Nominations of qualified persons for District Directors and County Committeemen are made by the respective County Committees or they are made by a petition signed by twen-

—continued on page 3

essary in order to raise map sales income to the point of offsetting printing costs and consultant (land appraiser) fees for developing cost in water tables.

Because there has been insufficient land transactions (sales, etc.) to establish a basis for developing new cost in water values for 1969, the Internal Revenue Service has authorized the use of the 1968 values for land acquired in 1969.

Cost in water tables, for the years 1953 through 1968 have been purchased for Precinct 3, Crosby County. The 1968 cost in water values for this county will also be applicable for 1969.

### Former Methods

Prior to 1969, the annual decline maps were prepared after the annual measurement of the depths to water in the observation wells were made in January of each year. This is to say that the 1968 decline maps were made from the decline data provided by subtracting the depth to water measurement made in each well in January 1968 from the depth to water measured in the same well in January 1969.

It requires about three weeks to measure the depths to water in the more than 800 observation wells within the District. Although the District now uses three digital computer routines to process the water-level data, it requires nearly two weeks to "handle" these data before the work of preparing (contouring) and printing these maps can begin. In previous years, this left only one week to contour 15 maps, covering over 8,000 square miles, before their release on February 15.

The interest in the February 15 date is based upon this date being a deadline for some taxpayers for filing final tax returns for the year preceding, hence the District's efforts to publish these maps on or before this date.

Experience has shown that it is extremely difficult to collect the data, and to prepare accurate and equitable decline maps for the entire District in this limited amount of time (January 1 to February 15).

Since the annual decline maps have been published on or immediately be-

—Continued on Page 2

## DANGER FOR DALLAS

(Reprinted from the Dallas Morning News, Sunday, November 23, 1969.)

Danger signals for Dallas are discernible on the distant High Plains of Texas. Failure to heed them can prove costly, not just to this city but to the entire state.

They warn of future water shortages, something many may be tired of reading about. But ignoring them is useless and hazardous. All of us in Texas are involved, as are future generations.

Latest evidence of the coming crisis is in data on irrigation use of water, from Leon New, agricultural extension irrigation specialist at Lubbock. He reports 5,442,196 acres irrigated in 42 Panhandle-Plains counties. This is the second-highest acreage on record, almost three times the total 20 years ago.

The number of wells is at a record high of 64,539, more than four times the number two decades ago. Average acreage irrigated per well is down from 140 acres in 1950 to 84 in 1969.

As New emphasized, "These figures are shouting words of caution and the need for precision management of the remaining supply of underground water."

In addition, many thoughtful Texans agree, they point up the need for conservation by legal proration if it can't be achieved voluntarily—the urgency of some statewide plan to sup-

—continued on page 3

## WEST TEXAS WATER CONFERENCE

The eighth annual West Texas Water Conference will be held in Lubbock, Texas, Friday, February 6th; beginning at 8:00 A.M. in the Red Raider Inn (near the Tahoka Traffic Circle, in south Lubbock).

This conference, which is sponsored by the West Texas Water Institute and 31 cooperating agencies, will feature several distinguished speakers.

Copies of the program for the conference can be secured from Dr. Gerald W. Thomas and Dr. W. D. Miller, Texas Tech University, or from Frank A. Rayner, High Plains Underground Water Conservation District No. 1, Co-Chairmen and Secretary of the West Texas Water Institute respectively.



**A MONTHLY PUBLICATION OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1**

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JIMMY ROSS, Editor

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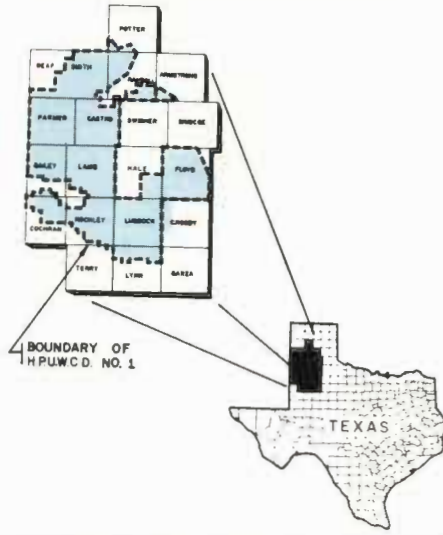
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**Precinct 5**

(FLOYD and HALE COUNTIES)  
Chester Mitchell, Vice-President ..... Lockney



# An Open Letter To Residents Of The High Plains Underground Water Conservation District No. 1

With the closing of 1969, your Water District will have been in existence 18 years and three months, since its creation was ratified by voters on September 29, 1951.

It is not my privilege to report on the past efforts, accomplishments, and failures of this Water District; for it has been my pleasure to manage its operations for less than five months out of its nearly two decades of history.

The history of the District is mirrored in the creation and implementation of the concept of groundwater basin management under the principles of private ownership. Whatever have been its successes, they are reflected in the predominance of its citizens accepting the responsibilities inherent in exercising the privilege of the unincumbered use of a common, but private property. Our Constitutional (Texas) right to the private ownership of groundwater has only

been guaranteed, and will only continue to be guaranteed, by our respect for the principles of its conservation.

The District's guide to conservation and preservation of Constitutional protections are embodied in the laws of its creation. Only by the groundwater owners and users understanding, accepting, and respecting these laws, and only by the management of the Water District within these laws, can we guarantee that the coming decades will be a history of service, accomplishment, and preservation of these principles.

It is within these restraints, and with the support and guidance of the duly elected Members of the Board of Directors, and with the aid of the Staff, that I pledge the services of the District to its citizens in 1970.

Frank Rayner, P.E.  
Manager

January 1, 1970

## Tax Guidelines...

—continued from page 1

fore the February 15 tax deadline (prior to 1969), most taxpayers have found it necessary to file amended returns to claim this allowance. Filing amended tax return increases the average High Plains taxpayer's accounting costs, and is otherwise unpopular with the claimant. Such returns also increase the workload of the Internal Revenue Service.

### Well Measuring Season

Since the annual decline map preparation procedures worked a hardship on the District's manpower capabilities; and since the date of release of such maps was unpopular with the taxpayer, and time consuming to the Internal Revenue Service; other procedures for the preparation of these maps were studied.

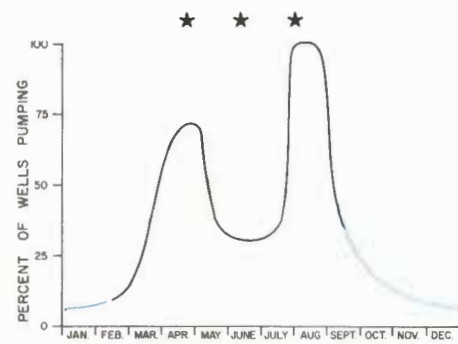
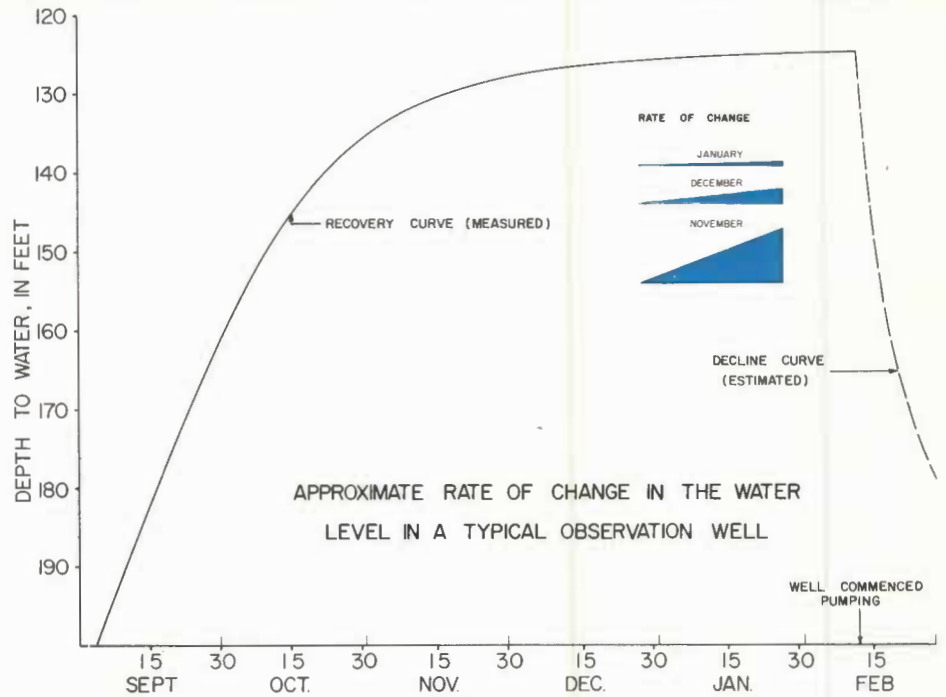
The first and most apparent suggestion was to measure the depths to water in the observation wells earlier in the year—in November or December—in order to allow more time for map preparation. However, the geo-

hydrologic parameters of the aquifer, type of well development, seasonal demand (pumpage) on the aquifer, type of wells measured and other factors seriously restrict the advisability of measuring water levels (throughout most of the District) during the last two months of the year.

### How Development Effects Water Levels

The wells wherein the depths to water are measured annually (observation wells) are, almost without exception, irrigation wells. Most of these wells are used to produce water during the preplant-irrigation, and growing season (at intervals, from February through November).

The approximate operation cycle of these wells is shown by the curve, "Approximate Relationship of Number of Irrigation Wells Pumping Each Month." This curve illustrates the normal "resting period" (blue curve) for most irrigation wells—commencing in September and extending through January. The length of this resting period is very critical in re-



Approximate relationship of number of irrigation wells pumping each month.

started pumping on February 12).

The recovery curve shows the "built in" error that would be inherent in annually making depth to water measurements in November and December, particularly in November. This inherent error is minimized by measuring wells during the early part of January each year.

To further extend the wells' resting period would increase the chances that such wells would have commenced pumping (preplant irrigation) before they could all be measured (in the event inclement weather delayed or interrupted the measuring program).

### New Method Tried

To facilitate the preparation of the annual decline maps, and to make this program more compatible to the taxpayer and the Internal Revenue Service, the schedule and procedures for preparing these maps has been revised.

A series of digital computer printouts were prepared showing the average decline of the water level in each observation well for the seven year period from January 1962 to January 1969; for the five year period from January 1964 to January 1969; and for the three year period from January 1966 to January 1969.

These averaging printouts were compared with machine printed hydrographs of each well, and a printout of a statistical summary of the water level and adjusted decline records. In agreement with Internal Revenue Service engineers, the seven year average decline values were selected for contouring. This value, in addition to the three and five year average decline values, and the excess (over) or deficit (under) decline that has been assigned each well in previous years (as taken from the statistical summary printout) was plotted on the workmap. Adjusting where appropriate, these values were then contoured to produce the decline map to be used to claim 1969 cost-in-water-depletion, income-tax allowances.

By using these methods, the 1969

spect to measuring static or near static water levels.

When a well is pumped, a depression is created in the aquifer. This depression resembles an inverted cone, the apex being at the center of the well. It is this "cone of depression" that creates the gradient potential that allows water to move swiftly into the cavity, and hence the high rate of production of most of the wells in this area.

When pumping is stopped, water migrates into this depression, filling it and causing the water level to rise in the "resting" well. The rate of filling of the cone of depression is very rapid immediately after pumping is stopped. As the depression proceeds to fill, the gradient is reduced and the rate of filling is reduced correspondingly.

It is this condition of the filling of the depression around a resting well that is illustrated by the curve, "Approximate Rate of Change in the Water Level in a Typical Observation Well." It is this rate of filling that dictates when the static depth to water must be measured in this area's observation wells.

This curve would shift to the left if the well had stopped pumping earlier in the season, or to the right if pumping had been stopped later in the season. Depending upon climatic conditions, the recovery period for such wells can be further shortened if preplant irrigation is commenced earlier in the year (this curve shows this well



decline allowances will probably be greater than those that would result from using January 1969 and January 1970 water-level data, because, the rates of decline in previous years (early 1960's) was greater than that of more recent years. By using these procedures, the decline allowed in any given year would lag behind the more recent trend in the rate of water-level declines.

These new procedures will be subject to continued study by the District and the Internal Revenue Service.

*Automation Anticipated*

In order to facilitate the procedures for maintaining the cost-in-water-depletion, income-tax allowance program, and to reduce the costs of maintaining this program, the District is establishing some procedural changes that will, hopefully, lead to its complete automation. The objective is to eventually eliminate map preparation, and to maintain this work through digital computer routines.

In order to implement these procedures, it will be necessary for each claimant, or his agent (accountants), to supply the District with the legal description of each parcel of land for which an allowance is claimed. This can be done by:

- 1) Providing the District with a copy of the reverse side of I.R.S. Form 665;
- 2) returning to the District the 1969 decline map with the parcel(s) shown thereon (the District will, in turn, return the map to the party providing same);
- 3) providing the District with a list of the legal descriptions of the parcels claimed.

Accountants should number the parcels claimed in a convenient manner. The District will then assign a code number to each parcel, and provide the accountant with a list showing the number he used, and the number assigned thereto by the District.

It is the District's intention to not publish the 1970 decline maps, but to make the decline data for each parcel available directly to the claimant, or his accountant.

In order to process these changes with existing personnel, it will be necessary that the legal description data (as noted above) is submitted to the District early in 1970; in order that the individual parcels can be located, numbered, and verified in time for the District to supply the 1970 decline data.

If copies of I.R.S. Form 665 or a list of the legal descriptions for the individual parcels are submitted to the District, these data will be plotted on a map and the map returned to the individual supplying same, for his verification of location.

Forms can be secured from the District for listing the legal descriptions of the individual parcels.

**District Election . . .**

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ty-five qualified voters in the area involved.

Nominees for Directors and Committeemen's places are as follows:

**NOMINEES FOR DISTRICT DIRECTOR**

(One to be elected for each precinct)

Director's Precinct No. One (1)—Territory within the District which is situated in each of the following counties: Crosby, Lubbock, and Lynn.

**Water Levels . . .**

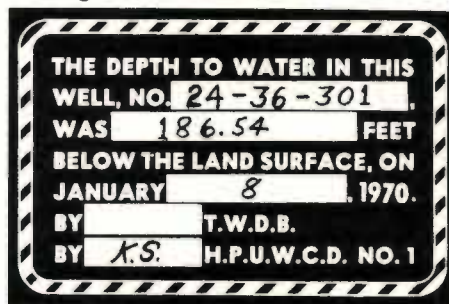
—continued from page 1

Survey in the early 1930's. These measurements provide the only continuing inventory of this area's remaining water supply.

The 442 observation wells in Bailey, Cochran, Hockley, Lamb, Lubbock and Lynn Counties will be measured by Kenneth Seales, Obbie Goolsby and Dan Seale, all District personnel.

Within the District, the 409 wells in Armstrong, Castro, Crosby, Floyd, Hale, Parmer, Potter and Randall Counties will be measured by Wayne Wyatt, Herbert Spradlin, Hershell Davidson, Charles Cornelius, and Charles Ferguson, all Texas Water Development Board personnel.

A red, 4 by 2½-inch, stick-on tag (see example below) will be affixed to the well-head (gearhead) of every observation well. This tag will show the well number; depth to water below the general land surface in the vicinity of the well; date of measurement; and the initials of the person making the measurement.



The depth to water measurements made this January will be published in the February 1970 issue of The Cross Section.

**Dallas . . .**

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plement underground water with that from out-of-state sources—and the importance of eradicating water-wasting, pernicious plants.

To dawdle in facing the realities of Texas' future water supplies is dangerous. Yearly, the wells must go deeper for water and the streams and lakes must furnish more of the fluid that nurtures industry and permits population to grow. Too soon, in a decade or so at the most, the present sources will be exhausted. In all likelihood, unless we get on with the job of meeting water requirements, the state's entire future will be threatened also.

Ray Kitten, Rt. 1, Slaton, Texas  
Russell Bean, 2806 21st St.,  
Lubbock, Texas

Director's Precinct No. Two (2)—Territory within the District which is situated in each of the following counties: Cochran, Hockley, and Lamb.

S. H. Schoenrock, 112 Rip St.,  
Levelland, Texas  
K. B. Parish, Box 154,  
Springlake, Texas  
W. B. Jones, Route 1, Anton, Texas  
Roy Hickman, Box 846,  
Morton, Texas

Director's Precinct No. Five (5)—Territory within the District which is situated in each of the following counties: Floyd and Hale.

Chester Mitchell, Lockney, Texas  
W. D. (Dub) Scarborough, Jr.,  
Box 174, Petersburg, Texas

**NOMINEES FOR COUNTY COMMITTEEMEN**

**ARMSTRONG COUNTY**

Precinct 3  
Residents of Commissioner's Precinct No. 3 vote for one (1).

James Bible, Wayside, Texas  
Residents of Commissioner's Precinct No. 3 vote for one (1).

George Denny, Rt. 1, Happy, Texas  
Jack McGehee, Wayside, Texas

**BAILEY COUNTY**

Precinct 2  
Residents of Commissioner's Precinct No. 2 vote for one (1).

Ernest Ramm,  
Rt. 2, Muleshoe, Texas

Precinct 4  
Residents of Commissioner's Precinct No. 4 vote for one (1).

Adolph Wittner,  
Star Route, Baileyboro, Texas

**CASTRO COUNTY**

Precinct 2  
Residents of Commissioner's Precinct No. 2 vote for one (1).

Bobby Jones,  
1009 Lee, Dimmitt, Texas  
Bob Anthony, Rt. 4, Dimmit, Texas

Residents vote for one (1) committeeman-at-large.  
Dale Maxwell,  
Hiway 385, Dimmitt, Texas

**COCHRAN COUNTY**

Precinct 1  
Residents of Commissioner's Precinct No. 1 vote for one (1).

Jessie Clayton,  
706 S. Main Ave., Morton, Texas  
Floyd Taylor, Rt. 1, Morton, Texas

Residents vote for one (1) committeeman-at-large.

Hugh Hanson,  
Rt. 2, Morton, Texas  
E. C. Hale, Rt. 2, Morton, Texas

**CROSBY COUNTY**

Precinct 3  
Residents of Commissioner's Precinct No. 3 vote for two (2).

Jack Bowman, Lorenzo, Texas  
Kenneth Gray, Lorenzo, Texas

**DEAF SMITH COUNTY**

Precinct 1  
Residents of Commissioner's Precinct No. 1 vote for one (1).

L. B. Wortham,  
Rt. 3, Hereford, Texas  
Residents vote for one (1) committeeman-at-large.

Frank Zinser, Jr.  
Rt. 5, Hereford, Texas

**FLOYD COUNTY**

Precinct 4  
Residents of Commissioner's Precinct No. 4 vote for one (1).

Fred Cardinal,  
Rt. 4, Floydada, Texas

Precinct 2  
Residents of Commissioner's Precinct No. 2 vote for one (1).

Pat Frizzell,  
Box 1046, Lockney, Texas

**HALE COUNTY**

Precinct 2  
Residents of Commissioner's Precinct No. 2 vote for two (2).

Charles Schuler, Petersburg, Texas  
Don Hegi,  
Box 160-A, Petersburg, Texas

Forrest Young,  
Box 371, Petersburg, Texas  
Henry Kveton,  
Rt. 2, Petersburg, Texas

**HOCKLEY COUNTY**

Precinct 3  
Residents of Commissioner's Precinct No. 3 vote for one (1).

Jimmy Price,  
Rt. 3, Levelland, Texas  
Harley Stanley,  
Rt. 3, Levelland, Texas

Residents vote for one (1) committeeman-at-large.

J. E. Wade, Rt. 2, Littlefield, Texas  
E. E. Pair, Whitharral, Texas

**LAMB COUNTY**

Precinct 1  
Residents of Commissioner's Precinct No. 1 vote for one (1).

Jack Thomas, Box 13, Olton, Texas

Precinct 4  
Residents of Commissioner's Precinct No. 4 vote for one (1).

Lee Roy Fisher,  
Box 344, Sudan, Texas

**LUBBOCK COUNTY**

Precinct 3  
Residents of Commissioner's Precinct No. 3 vote for one (1).

R. F. (Bob) Cook,  
804 6th St., Idalou, Texas  
Residents vote for one (1) committeeman-at-large.

Edgar Murphy,  
2120 71st St., Lubbock, Texas  
Dan Young, 4607 W. 14th St.,  
Lubbock, Texas

**LYNN COUNTY**

Precinct 4  
Residents of Commissioner's Precinct No. 4 vote for one (1).

Roger Blakney,  
Rt. 1, Wilson, Texas  
Residents vote for one (1) committeeman-at-large.

Orville Maeker,  
Rt. 1, Wilson, Texas

**PARMER COUNTY**

Precinct 4  
Residents of Commissioner's Precinct No. 4 vote for one (1).

Joe Moore,  
Box J, Lazbuddie, Texas  
Residents vote for one (1) committeeman-at-large.

Jim Ray Daniel, Friona, Texas

**POTTER COUNTY**

Precinct 4  
Residents of Commissioner's Precinct No. 4 vote for two (2).

Fritz Menke,  
Rt. 1, Box 538, Amarillo, Texas  
Vic Plunk, Rt. 1, Amarillo, Texas



## District Election . . .

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### RANDALL COUNTY

#### Precinct 1

Residents of Commissioner's Precinct No. 1 vote for one (1).

Marshall Rockwell, Canyon, Texas

#### Precinct 2

Residents of Commissioner's Precinct No. 2 vote for one (1).

Richard Friemel,  
Rt. 1, Canyon, Texas

Blank spaces shall be provided on each ballot in order that the names of other persons may be written in. Each person residing in Director's Precinct One (1) and Two (2), and Five (5), as above set forth, shall vote for only one Director, namely the voter's choice for Director for the Director's Precinct in which the voter resides. All persons may vote for the candidate of their choice by scratching or marking out all other names in that race and leaving the name of their choice for Director on the ballot. All persons desiring to cast a vote for a candidate whose name is not on the ballot may do so by writing the name of that person in the blank space provided on the ballot and by scratching or marking out all other candidates appearing on the ballot for the Precinct Director. Persons residing in the counties composing the High Plains Underground Water Conservation District No. 1, as above set forth, shall elect County Committeemen for the county in which the voter resides. Each person may vote for the candidate of his choice by scratching or marking out all other names of the nominees for County Committeemen on the ballot. All persons desiring to cast a vote for a candidate whose name is not on the ballot may do so by writing the name of that person in the blank space provided on the ballot and by scratching or marking out all candidates whose names are printed on the ballot.

The polling places and officers for said election are as follows:

### ARMSTRONG COUNTY

#### Polling Place No. 1:

Schoolhouse in Wayside, Texas

#### Presiding Judge:

Willie Modisette, Box 146, Wayside, Texas

### BAILEY COUNTY

#### Polling Place No. 1:

Enochs Gin Office, Enochs, Texas

#### Presiding Judge:

W. R. Adams, Route 2, Morton, Texas

#### Polling Place No. 2:

High Plains Water District Office, Muleshoe, Texas

#### Presiding Judge:

B. H. Black, Route 2, Box 48, Muleshoe, Texas

### CASTRO COUNTY

#### Polling Place No. 1:

Brockman Hardware Co., Nazareth, Texas

#### Presiding Judge:

Mrs. Blanche Birkenfeld, Nazareth, Texas

#### Polling Place No. 2:

County Court House, Dimmitt, Texas

#### Presiding Judge:

Floyd Copeland, Dimmitt, Texas

#### Polling Place No. 3:

Easter Community Center

#### Presiding Judge:

Mrs. S. L. Garrison, Route 2, Hereford, Texas

#### Polling Place No. 4:

City Hall, Hart, Texas

#### Presiding Judge:

Percy Hart, Hart, Texas

### COCHRAN COUNTY

#### Polling Place No. 1:

2 miles West of Star Route Gin, Morton, Texas

#### Presiding Judge:

Danny Key, Star Route, Morton, Texas

#### Polling Place No. 2:

County Activities Building, Morton, Texas

#### Presiding Judge:

Clayton Stokes, Morton, Texas

### CROSBY COUNTY

#### Polling Place No. 1:

Lorenzo Community Center, Lorenzo, Texas

#### Presiding Judge:

E. B. Fullingim, Lorenzo, Texas

### DEAF SMITH COUNTY

#### Polling Place No. 1:

County Court House, Hereford, Texas

#### Presiding Judge:

Mrs. Walter H. London, Jr., 226 Ranger Dr., Hereford, Texas

### FLOYD COUNTY

#### Polling Place No. 1:

County Court House, Floydada, Texas

#### Presiding Judge:

R. M. (Fred) Battey, 529 W. Virginia, Floydada, Texas

#### Polling Place No. 2:

Barker Insurance Agency, Main & Locust, Lockney, Texas

#### Presiding Judge:

Barry Barker, Box 518, Lockney, Texas

### HALE COUNTY

#### Polling Place No. 1:

Community Center, Petersburg, Texas

#### Presiding Judge:

Gaylord Groce, Petersburg, Texas

### HOCKLEY COUNTY

#### Polling Place No. 1:

City Hall, Anton, Texas

#### Presiding Judge:

Orval Williams, Box 748, Anton, Texas

#### Polling Place No. 2:

Farm Center Gin, Ropesville, Texas

#### Presiding Judge:

Frank Sylvester, Ropesville, Texas

#### Polling Place No. 3:

County Court House, Levelland, Texas

#### Presiding Judge:

B. D. Carter, Box 534, Levelland, Texas

#### Polling Place No. 4:

Whitharral Lions Club Building, Whitharral, Texas

#### Presiding Judge:

Robert E. Avery, Jr., Route 2, Levelland, Texas

#### Polling Place No. 5:

City Hall, Sundown, Texas

#### Presiding Judge:

Mrs. T. I. Elliott, Box 743, Sundown, Texas

### LAMB COUNTY

#### Polling Place No. 1:

City Hall, Sudan, Texas

#### Presiding Judge:

Joe D. West, Box 63, Sudan, Texas

#### Polling Place No. 2:

Earth Gin, Earth, Texas

#### Presiding Judge:

Bob Belew, Box 62, Sudan, Texas

#### Polling Place No. 3:

County Court House, Littlefield, Texas

#### Presiding Judge:

Mrs. Arthur Jones, 707 Littlefield Dr., Littlefield, Texas

#### Polling Place No. 4:

Farmer's Co-op Gin, Spade, Texas

#### Presiding Judge:

C. C. Byars, Box 343, Spade, Texas

### LUBBOCK COUNTY

#### Polling Place No. 1:

Community Clubhouse, Shallowater, Texas

#### Presiding Judge:

Alton Hardy, Box 225, Shallowater, Texas

#### Polling Place No. 2:

Basement of New County Court House, Lubbock, Texas

#### Presiding Judge:

S. E. Gillespie, 2112 15th St., Lubbock, Texas

#### Polling Place No. 3:

City Hall, Idalou, Texas

#### Presiding Judge:

Carlos May, Idalou, Texas

#### Polling Place No. 4:

Community House, Slaton, Texas

#### Presiding Judge:

Wayne Liles, 305 S. 11th St., Slaton, Texas

### LYNN COUNTY

#### Polling Place No. 1:

Co-op Gin, Tahoka, Texas

#### Presiding Judge:

Joe Lewis, Route 4, Tahoka, Texas

#### Polling Place No. 2:

Wilson Co-op Gin, Wilson, Texas

#### Presiding Judge:

Mrs. W. C. Maeker, Box 92, Wilson, Texas

### PARMER COUNTY

#### Polling Place No. 1:

County Court House, Farwell, Texas

#### Presiding Judge:

Mrs. Albert H. Smith, Farwell, Texas

#### Polling Place No. 2:

Wilson & Brock Ins., Bovina, Texas

#### Presiding Judge:

Carl Rea, Box 106, Bovina, Texas

### POTTER COUNTY

#### Polling Place No. 1:

Schoolhouse in Bushland, Texas

#### Presiding Judge:

Mrs. James Walton, Box 76, Bushland, Texas

### RANDALL COUNTY

#### Polling Place No. 1:

V.F.W. Hall, 1 mile North of Canyon, Texas

#### Presiding Judge:

Emil Olson, Route 1, Canyon, Texas

#### Polling Place No. 2:

Columbus Club Hall, Umbarger, Texas

#### Presiding Judge:

W. P. Janssen, Box 35, Umbarger, Texas

BE SURE AND VOTE  
ON JANUARY 13, 1970!