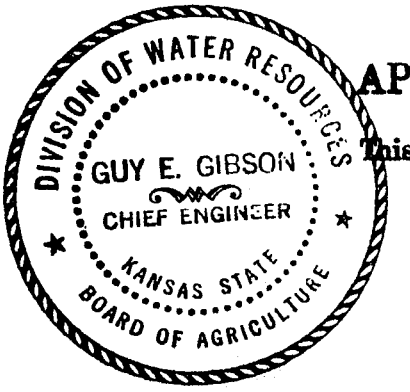
BIG BEND

GROUNDWATER MANAGEMENT DISTRICT

NO. 5

MANAGEMENT PROGRAM



APPROVED

This 18th day of June 1976

Guy E. Gibson

Chief Engineer
Division of Water Resources
State Board of Agriculture

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INTRODUCTION

The Big Bend Groundwater Management District #5 was organized through the efforts of concerned citizens to conserve, promote, and manage groundwater resources so that quality and quantity of that resource will be maintained for present and future needs. The Groundwater management laws establish the right of local land owners and water users to determine their own destiny with respect to the use of groundwater within the basic law of the State of Kansas.

Russell Herpich, Irrigation Engineer of K.S.U. saw the potential of the Big Bend area for irrigation back in the sixties and the urgent need to conserve and perpetuate this vast natural resource.

The 1972 Kansas Legislature enacted workable legislation enabling the formation of groundwater management districts. The Pratt County Soil Conservation District Board of Supervisors, recognizing the benefits of such a district, called a meeting October 16, 1973, to which leaders from area counties were invited to attend. A series of information meetings followed this meeting, and a steering committee was formed to carry out the organizing of the district according to the Kansas Groundwater Management District Act. The following steering committee began to function April 11, 1974.

Phil Shrack, Chairman	Iuka, Kansas
Nathan B. Hayse, Vice Chairman	Mullinville, Kansas
Boyd Mundhenke, Secretary	Kinsley, Kansas
Larry Panning	Ellinwood, Kansas
Bill Ball	Sterling, Kansas
Omar Schartz	Larned, Kansas
Bob Wendelburg	Stafford, Kansas
*Don Brownlee	Sylvia, Kansas

*Don Brownlee represented Reno County even though he could not be a legal member of the board--7 being the maximum number on the steering committee.

A declaration of intent and a proposed map of the district was filed by the Steering Committee to the Chief Engineer of the Division of Water Resources Kansas Department of Agriculture April 16, 1974.

On October 22, 1975, the description of the lands within the proposed district were certified by the Chief Engineer and a petition outlining the purposes of the district and other required information was then circulated by the Steering Committee. The petition was approved December 22, 1975, and election called for March 2, 1976, to allow eligible voters of the district to decide whether the district should be organized. Results of the election were 535 votes in favor and 211 opposed, passing by 72% majority.

The Certificate of Incorporation was issued by the Secretary of State March 9, 1976, and has been filed in the Register of Deeds Office in each of the eight counties within the district. An organizational meeting was held March 30, 1976, at the St. John Library for the purpose of electing directors and adopting by-laws. The directors and terms are as follows:

		(term expires)
Robert Wendelburg, Stafford County	President	1977
Larry Panning, Barton County	Vice President	1978
Don Fincham, Pratt County	Secretary	1977
Willard McClure, At Large	Treasurer	1979
Bill Ball, Rice County		1978
Omar Schartz, Pawnee County		1979
Bart Zongker, Reno County		1977
Cecil Vieux, Kiowa County		1979
Ray Cudney, Edwards County		1978

PURPOSES OF THE DISTRICT

The purpose of the Big Bend Groundwater Management District #5 shall be to conserve, promote and manage groundwater resources to the extent that quality and quantity of the resources will be maintained **to meet present and future needs.**

1. Establish a Data Gathering Bank
    a. Measurement of Water Withdrawal
    b. Measurement of Aquifer Recharge
    c. Other pertinent information
2. Establish a Water Quality Monitoring Program
3. Discourage Waste of Water
4. Develop an Educational Program on Optimum Wager Use
5. Develop Well Spacing Criteria
6. Encourage Accurate Production Measurements
7. Promote Tail-Water Pits
8. Exert Action to Prevent Water Pollution
9. Review Replacement Wells
10. Review and Authorize Annual Appropriation of Water Usage (subject to approval of the Chief Engineer)
11. Investigate Alternate Point of Diversion
12. Explore and Develop Artificial Recharge
13. Provide advice assistance in the management of drainage problems and surface water

DESCRIPTION OF THE DISTRICT

Big Bend Groundwater Management District #5 is located in south central Kansas. The name of Big Bend was derived from the fact that the district lies south of the large bend of the Arkansas River. Included in the district are parts of the following counties: Barton, Rice, Pawnee, Reno, Edwards and Kiowa. Also all of Stafford and Pratt Counties.

It has been stated by hydrologists that the area of the Big Bend district has one of the best recharge aquifers in the state and therefore the brightest future in irrigation. The saturated thickness has been estimated to be as much as 200 ft. thick in certain areas with well capacities ranging from 200 gallons to over 2000 gallons per minute. With the static level of the water table ranging from 10 to 100 ft., pumping costs have been held to a minimum.

Approximately 2,524,000 acres of land are included in the district. Presently over 300,000 acre feet of water per year is being used for irrigation.

Included within the district are two major salt basins, the Cheyenne Bottoms in the northern part of the district and the Salt Marsh in the east central area of the district. With these two basins and industrial wastes, pollution is a continual problem.

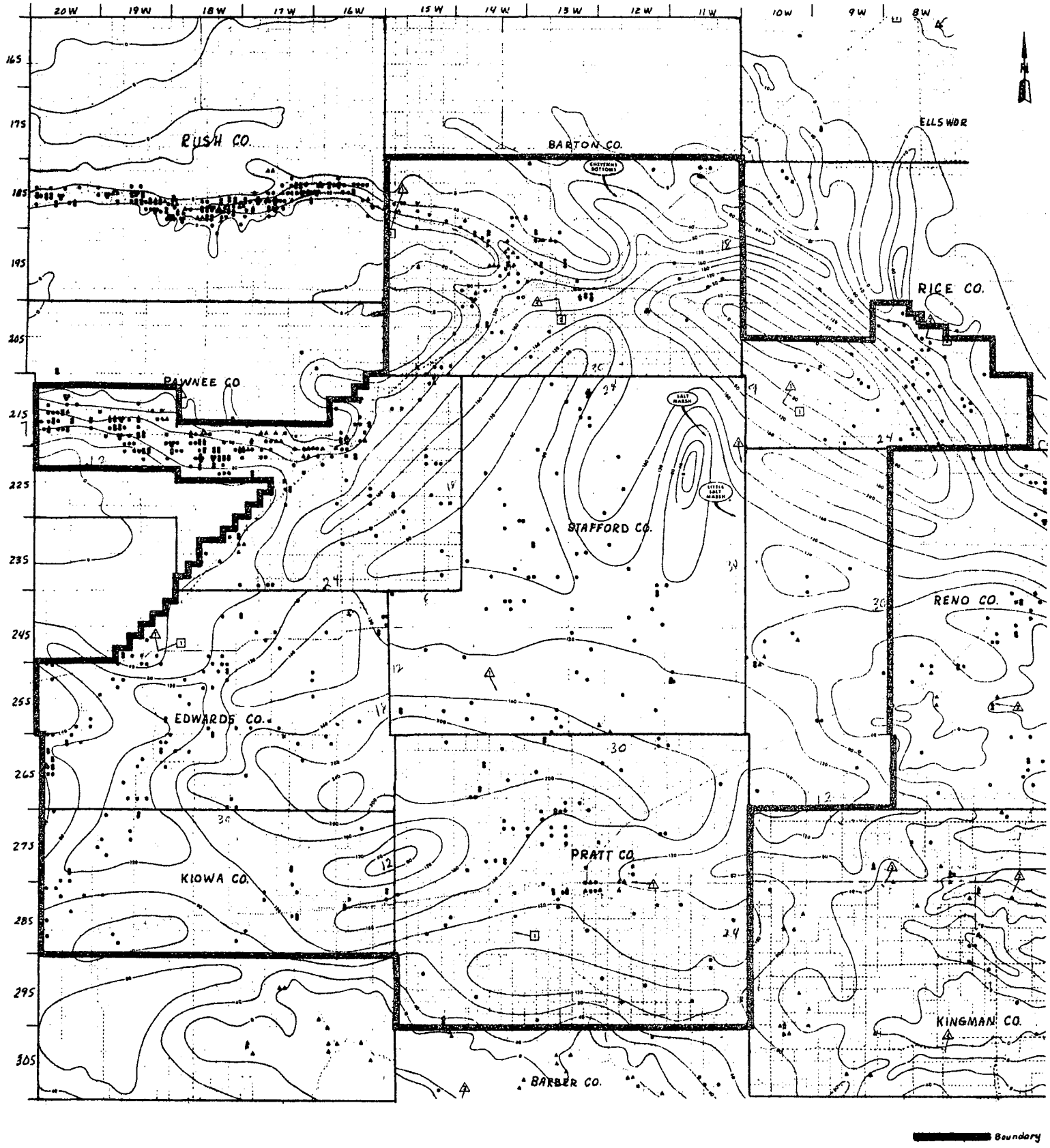
Average rainfall ranges from 20 inches in the west to 27 inches along the eastern border.

With a major portion of the soil being in the sandy to sandy loam category, pivot sprinkler irrigation is the main method being used with gravity following a close second.

Due to a seven month growing season, moderate rainfall, and sandy loam soils, the district has the potential of growing various types of

crops. For example, corn, sorghums, wheat, alfalfa, beans, potatoes, melons, and specialty crops such as truck gardening, Christmas trees, and others are grown in the district.

Big Bend Groundwater Management District #5



DESCRIPTION OF AREA SOILS

Big Bend Groundwater Management District

A. Area: These are upland, hardland areas of Barton, Pawnee, Pratt Edwards, Rice and Kiowa Counties. They consist of well-developed silty and clayey soils. They are dominantly well-drained, deep, fertile soils. Some small places of rock and shale occur on slopes. Water erosion and soil blowing are the major concerns of management.

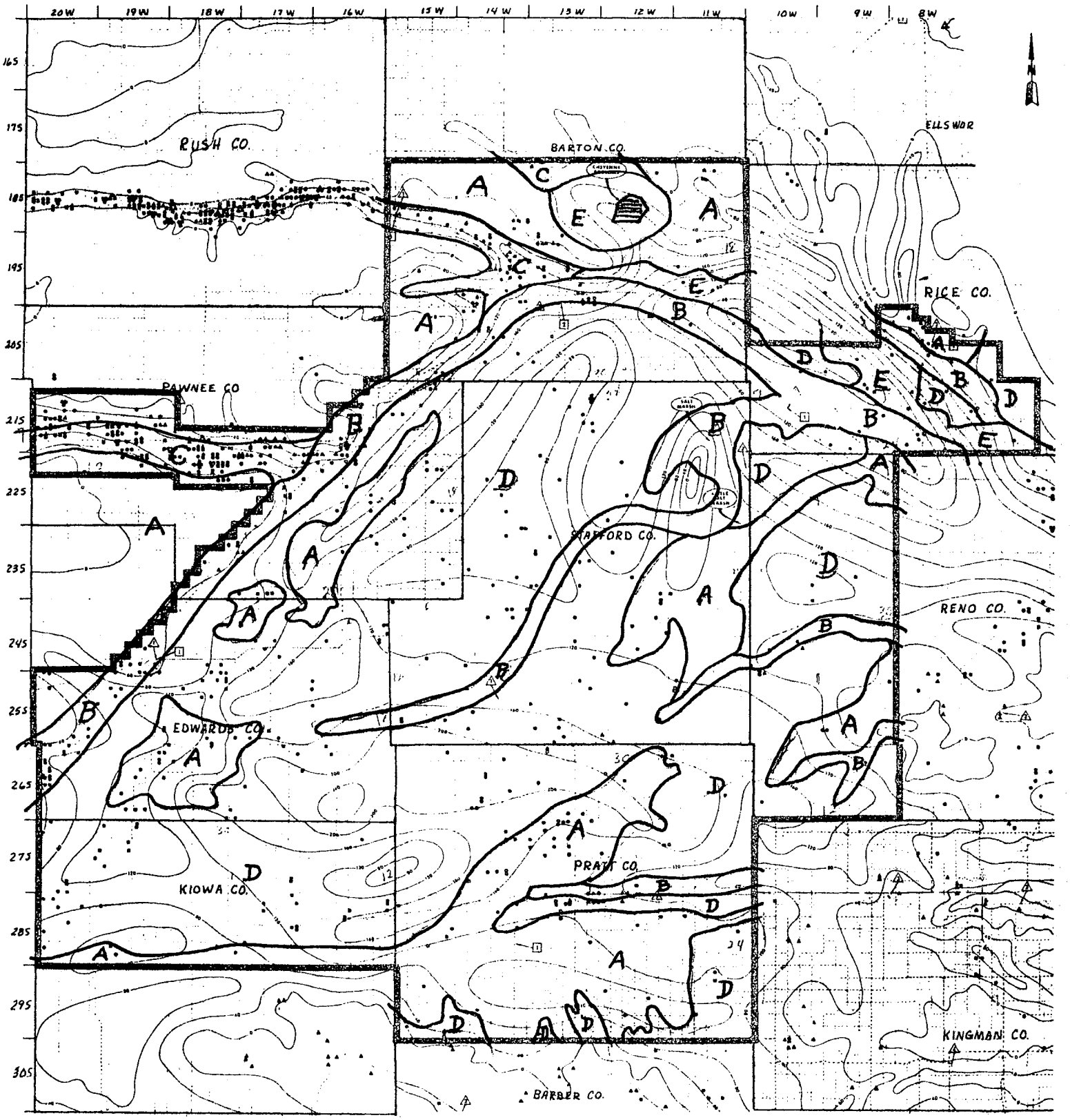
B. Area: These are flood plain areas of the major rivers such as Arkansas River, Rattlesnake Creek, South Fork of the Ninnescah River, and North Fork Ninnescah River. These flood plains consist of poorly drained and somewhat poorly drained sandy and loamy flooded soils. They are deep to shallow over sandy strata with a fluctuating water table. They are slightly to moderately saline. Most are frequently flooded and some small areas have salt-affected spots. The main concerns of management are flooding and soil blowing.

C. Area: There are flood plain areas such as the Pawnee River, Walnut Creeks, Blood Creek, Deception Creek, Cow Creek and Little Arkansas River. These flood plains consist of deep, silty and loamy soils and some smaller areas of clayey soils. These soils are mainly well-drained but are flooded and have water tables deeper than 6 feet. The main concerns of management are flooding and soil blowing.

D. Area: These are uplands, consisting of moderately sandy, and clayey areas of Barton, Pawnee, Edwards, Kiowa, Stafford, Reno, Pratt and Rice Counties. It is the largest area of the district. It is formed in old alluvium that has been reworked upon the surface by wind. Soils are deep and range from sand to clay. They are dominantly moderately sandy. They are fertile and well-drained except small areas are low, wet and poorly drained and formed in clayey alluvium or sandy or loamy materials underclaim by clay. Other small high areas are sand hills. The main concern of management are soil blowing and soil drainage of low areas. The slope gradient of this entire area is low or very low and suitable outlets for excess water are difficult to establish.

E. Area: These are terrace and uplands consisting of silty to clayey soil areas mainly in Barton, Rice and Reno Counties along the Arkansas River and Peace Creek. These soils are deep and slowly permeable to very slowly permeable and have varying degrees of salt accumulation layers. Saline and alkali spots are common. The main concerns of management are soil blowing and to maintain tilth and fertility.

SOIL AREAS
Big Bend Groundwater Management District



LEGEND

Proposed Boundary

A. Hardlands.
B. Sandy and Loamy Flood Plains.
C. Silty Flood Plains.
D. Loamy, Clayey, and Sandy Uplands.
E. Silty to Clayey Terraces and Uplands.

Cheyenne Bottoms.

5/26/76 D.A.D.

GROUNDWATER SUPPLY PROBLEMS

Two hundred and fifty applications for permits to appropriate water were received in the area of the Big Bend Groundwater Management District during the three month period from January 1, 1976, to March 31, 1976. This demonstrates the fantastic growth rate of irrigation in the Big Bend. Even with the excellent natural recharge that we have in the area, in a prolonged drought period, areas with shallow saturated thicknesses could have critical declines.

The quality of the major groundwater supplies over the western part of the district is generally good; however, in the eastern areas, poor quality water is a serious problem. This pollution is both natural and man made. Oil exploration and production have been or are still active in the area. Thousands of holes have been drilled in the area--not only by oil exploration but also irrigation wells which were drilled too deep and not plugged properly thus allowing spilling between the aquifers.

As the good water is pumped from the top aquifer, will poor quality water replace it? Will chemicals applied through systems leach in to the aquifer? These and many other questions need an answer.

Because of our relatively shallow wells, pumping costs are much more economical than the western districts of the state. Natural gas, our cheapest source of energy is not always available, so more expensive diesel, LP gas, and electric power are used. A continuing availability of economical energy supply is necessary for the economical growth of the district.

MANAGEMENT PROGRAMS

It is felt that the objectives and purposes of the district can best be accomplished by a combination of programs to provide for the orderly and economical development, wise use and responsible management of water available to the people of the district. This will include the investigation of quantity and quality of water presently available, efficient use and management of existing water.

I. Geological Data Collection and Study

Research, investigation and collection of data on the hydrological characteristics of the groundwater supplies and their use in the district is essential to develop a comprehensive management program. A great deal of information has been accumulated through state and federal research programs. The district will utilize all available information and develop or assist with the development of additional information as required to develop management techniques needed. Individual studies are as follows:

A. Water quality - study or encourage study to investigate and monitor the quality of groundwater within the district. To locate and identify sources of salt water pollution whether natural or man-made and implement such procedures and action as may be needed through appropriate agencies.

B. Water level measurement - utilize data from existing measurements by state and federal agencies and expand in the district as necessary to allow the monitoring of the water level and preparation of water level maps.

C. Water use study - update existing data and collect additional information relative to the number, location and physical characteristics of wells within the district. These data will be used to assess water use within the district and help develop management programs.

D. Interrelationship of surface and groundwater within the district - encourage the study of such relationships by the appropriate state and federal agencies.

E. Legal aspects of water and its use - study the legal aspects of water use, potential management programs and related matters. Provide input into legal or legislative matters affecting the use of water within the district.

II. Discourage Waste of Water

A. Irrigation Application Losses - Studies show that under normal irrigation practices, approximately 15 to 30% of the water applied by irrigation is either lost by tailwater runoff or deep percolation in the field. However, tailwater systems to collect and reuse this water are common in various parts of the district. In addition, some of this water apparently re-enters the aquifer as recharge and is only temporarily lost.

Tailwater systems generally offer an economical way of utilizing runoff water, improving the overall irrigation application efficiency, and improving the recharge capability of the system. In addition, they can be utilized to collect rainfall runoff for utilization or recharge to the aquifer.

The district will encouarge the use of tailwater reuse systems on both surface and sprinkler type irrigation, wherever feasible and possible.

B. Industrial and Irrigation Water Waste - Through the development of memorandums of understanding with the Division of Water Resources, Kansas Board of Agriculture, and the State Department of Health and Environment, immediate action will be taken on the pollution and flagrant waste of water.

III. Research and Education on the Conservation and Efficient Use of Water

Continuing research is needed to develop techniques of producing optimum crop yields with minimum water. The district will encourage research on efficient and economical use of water. The district will also provide leadership in the demonstration of the use of efficient irrigation systems and practices. Special items of interest include:

A. Optimum crop practices to minimize the use of water.

B. Encourage the wide use of water meters and other measurement devices as a management tool to assist with the proper application of water. The district will assist with the selection and procurement of recommended devices, installation instructions and other matters related to their use.

C. Development and use of crops requiring less water.

D. Development of methods or practices to more efficiently use rainfall and reduce evapotranspiration.

The district will compile and present information relative to the efficient use of water for irrigation and other purposes. The

members of the district will be informed of district programs and activities through news releases, publications, newsletters and meetings.

IV. Water Appropriation Rights

The district recognizes that a water right is a real property right. However, any use of water shall be within the limits of an existing water right. The district will cooperate with the Division of Water Resources, Kansas State Board of Agriculture, to determine rates of diversion and total annual quantities for proposed beneficial uses of water within the district.

The district feels the matter of additional large capacity wells and their location within the district requires special attention to insure the proper management of the available groundwater resources. The planning of this process is essential to protect the public interest and rights of present and future water users within the district. The following policies are adopted to help accomplish this objective:

A. Applications for Beneficial Use of Water

Through an agreement with the Chief Engineer, Division of Water Resources, copies of all new applications filed for a permit to appropriate water for beneficial use within the district will be submitted to the district for recommendation. The district may assist in the preparation of said applications, but will not be responsible for submitting the application to the Chief Engineer.

B. Well Spacing

Due to varying saturated thickness of the aquifer within the district, multiple well systems must sometimes be

implemented in order to obtain adequate water to operate a system. The Board of Directors realizes that well spacing regulations at this time must be somewhat flexible. When depletion data has become available, more concrete recommendations will be made. As a guide to judgment, the Board of Directors sets a minimum well spacing of one-fourth mile, except for the spacing of domestic wells. It must be proven to the satisfaction of the Board of Directors and the Chief Engineer that any closer well spacing neither will impair a use under an existing water right, nor prejudicially and unreasonably affect the public interest.

C. Well Standards

Since well drillers must now complete a log on every well drilled, the Board of Directors would request cooperation with the State Dept. of Health and Environment and Division of Water Resources to have access to log reports and also that a water quality report be filed along with the log report and these be made available to the Board of Directors.

It is also recommended that all new large capacity wells, greater in capacity than 100 gallons per minute, completed within the district after January 1, 1977 shall be:

1. Equipped with an opening properly designed for a flow meter as approved by the district to measure the capacity and quantity of water diverted by said well.

2. Equipped with an access tube or other such device as approved by the district to allow the measurement of the water level and drawdown in said well.

3. Equipped with check valves to prevent pollution of aquifer by fertilizer, herbicide, insecticide, etc.

V. Collection and Use of Run-Off

A vitally important aspect is the collection and use of run-off. From the research which has been conducted by the U.S. Geologic Survey, it has been found that vast amounts of water can be held and recharged into the aquifer. Because of the land characteristics of our district, rolling sandy pastures, the area has a high degree of recharge rate. We are fortunate in this asset.

The District recommends the following two types of structures:

A. An embankment type of construction would be utilized where there are natural waterways. We encourage this type of construction because of its higher degree of recharge.

B. On center-pivots and leveled ground, the construction of tailwater pits located in the lower area which would contain both irrigation tailwater and a 3-inch rainfall as determined by the local Soil Conservation District.

A return system should be utilized in both types of construction.

The District recommends the use of both types of collection structures, open pits and embankment-type installations, on dryland to control normal rainfall which would benefit the recharging of the aquifer.

VI. Alternate Sources of Water

The District will encourage and assist in any way possible the development of imported water projects or construction of surface water storage structures as alternate sources of water supply.

DISTRICT OPERATION

The district will be managed from an office in St. John, Kansas. Additional offices may be established within the district as necessary. The board of directors will be responsible for setting policy and objectives for the district to accomplish. The district will employ such staff as necessary to carry out the programs of the district. This will initially include a district manager and a secretary.

The board of directors recognizes the need for the best possible management of the available resources. Because of this, as much local input as possible is being directed at new and improved methods of managing the water supply. This will be accomplished through research, education, demonstration projects and management guidelines.

The board of directors will meet the second Thursday each month to review activities of the district and develop programs. An annual meeting for all eligible voters will be held early each year to provide information about the district's programs and allow for input from the membership.

STATE OF KANSAS
DIVISION OF WATER RESOURCES
KANSAS STATE BOARD OF AGRICULTURE
TOPEKA, KANSAS

BEFORE GUY E. GIBSON, CHIEF ENGINEER
DIVISION OF WATER RESOURCES
KANSAS STATE BOARD OF AGRICULTURE

IN THE MATTER OF THE MANAGEMENT PROGRAM
OF BIG BEND GROUNDWATER MANAGEMENT DISTRICT NO. 5
BARTON, RICE, PAWNEE, RENO, EDWARDS, KIOWA,
STAFFORD AND PRATT COUNTIES, KANSAS

R E P O R T

On this 18th day of June, 1976, after consideration of the management program for Big Bend Groundwater Management District No. 5, Barton, Rice, Pawnee, Reno, Edwards, Kiowa, Stafford and Pratt Counties, Kansas, a copy of which was transmitted to him by the Board of Directors of the district on June 14, 1976, and having examined and studied the management program, the Chief Engineer makes the following findings:

1. The management program contains a written report describing the characteristics of the district and the nature and methods of dealing with groundwater supply problems within the district.

2. The report includes information as to the groundwater management program to be undertaken by the District and such maps, geological information, and other data for the formation of such a program.

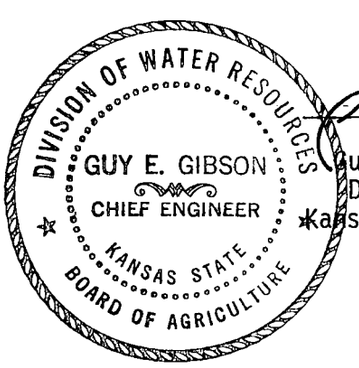
3. The management program is compatible with Article 7 of Chapter 82a of the Kansas Statutes Annotated, and all acts amendatory thereof or supplemental thereto and any other state laws or policies.

4. A request for the Chief Engineer's approval of the management program has been made by the Board of Directors of Big Bend Groundwater Management District No. 5.

O R D E R

It is the order of the Chief Engineer that the management program, as submitted, for Big Bend Groundwater Management District No. 5, Barton, Rice, Pawnee, Reno, Edwards, Kiowa, Stafford and Pratt Counties, Kansas, should be and herewith is approved.

Done at Topeka, Kansas, this 18th day of June, 1976.



Guy E. Gibson

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Division of Water Resources
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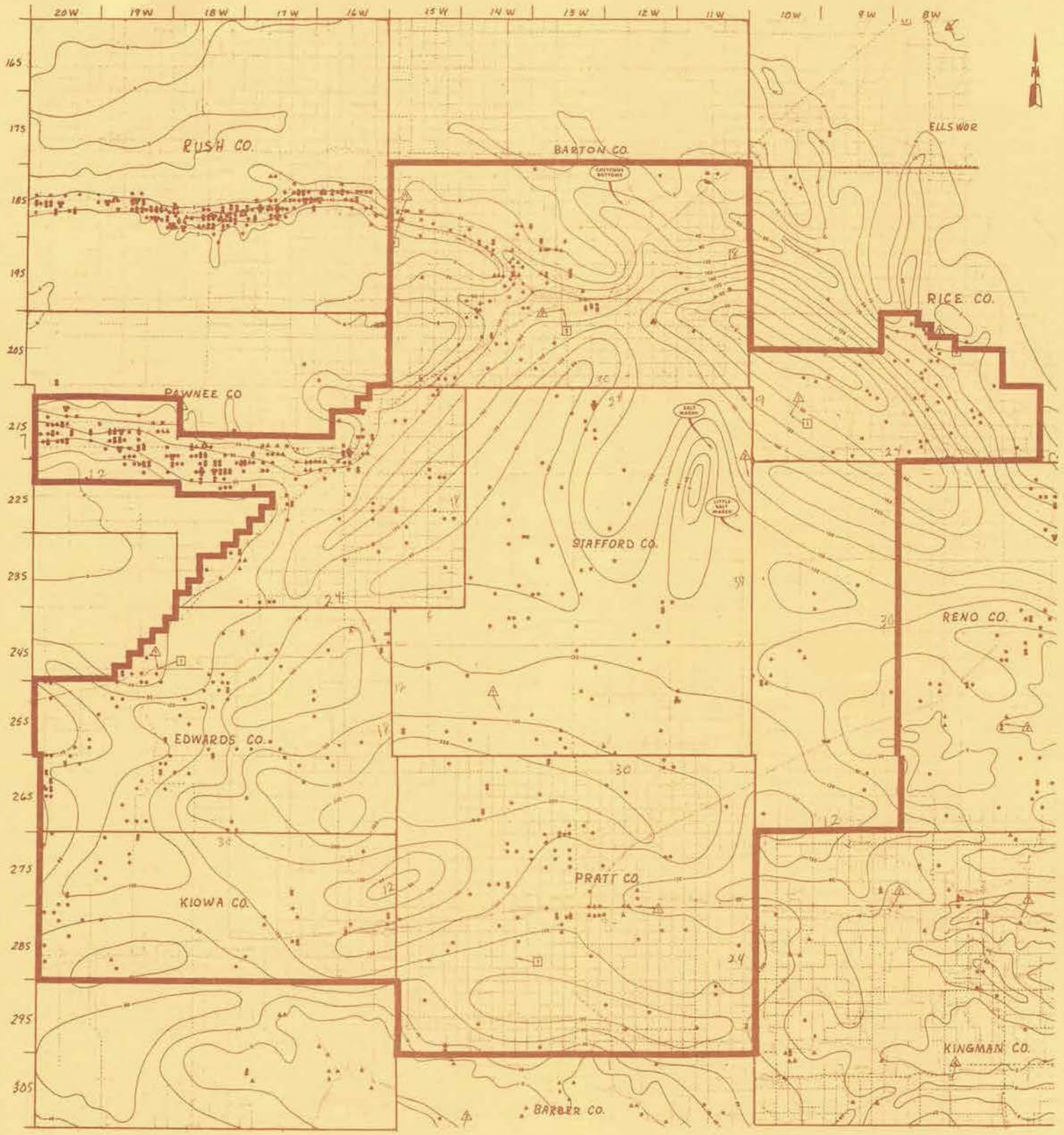
Big Bend Groundwater Management District



Proposed Boundary

A Look At Groundwater Conservation In The Big Bend

Groundwater stored below the surface is the major source of water for the proposed Big Bend Groundwater Management District. This supply of water may be threatened.

In the proposed eight county district there were a total of 107 water permits issued in 1972. This number of permits increased to 453 in 1975, or a 240% increase. If the present growth rate of 60% increase per year continues, it would mean approximately 1300 additional permits would be issued during the year of 1980.

As usage rates increase and more draw down occurs, quality as well as quantity of water becomes an ever more increasing concern.

To assure a supply of good water for future generations one of the prime objectives of the Groundwater Management District will be to monitor and evaluate water.

WHAT POWER DOES A GROUNDWATER MANAGEMENT DISTRICT HAVE? The districts have broad powers relating to the use and conservation of groundwater. The districts MAY recommend rules and regulations to the Chief Engineer. The rules and regulations can be enforced only if adopted by the Chief Engineer to carry out the provisions of the state water law. The powers of the district will be carried out by an elected Board of Directors. The Board may make land assessments not exceeding $0.05 per acre per year for land in the district and/or a water charge not exceeding $0.30 per acre-foot of water withdrawn. Assessments cannot be levied until after a public hearing on a proposed budget. LAND ON WHICH NO WATER IS USED OR WITHDRAWN MAY BE EXCLUDED FROM DISTRICT ASSESSMENTS.

WHO IS AN ELIGIBLE VOTER? A person 18 years and older who owns 40 acres in the district or uses one acre-foot or more of groundwater per year in the district. Cities are entitled to one vote, if they qualify under the above provisions.

Educational meetings will be held throughout the eight counties—watch for announcements.

ELECTION DATE WILL BE MARCH 2, 1976. Watch your local newspaper for polling locations.

AN IMPORTANT NOTE TO DRY LAND OWNERS**

Farmland underlaid with large quantities of good quality groundwater is a valuable asset. Good land and good water will be the mainstay of our future agriculture.

AN IMPORTANT NOTE TO IRRIGATION FARMERS**

Water users should be concerned with an adequate supply of good quality water for future use.

PROPOSED PURPOSES

To conserve, promote and manage groundwater resources to the extent that quality and quantity of the resources will be maintained to meet present and future needs.

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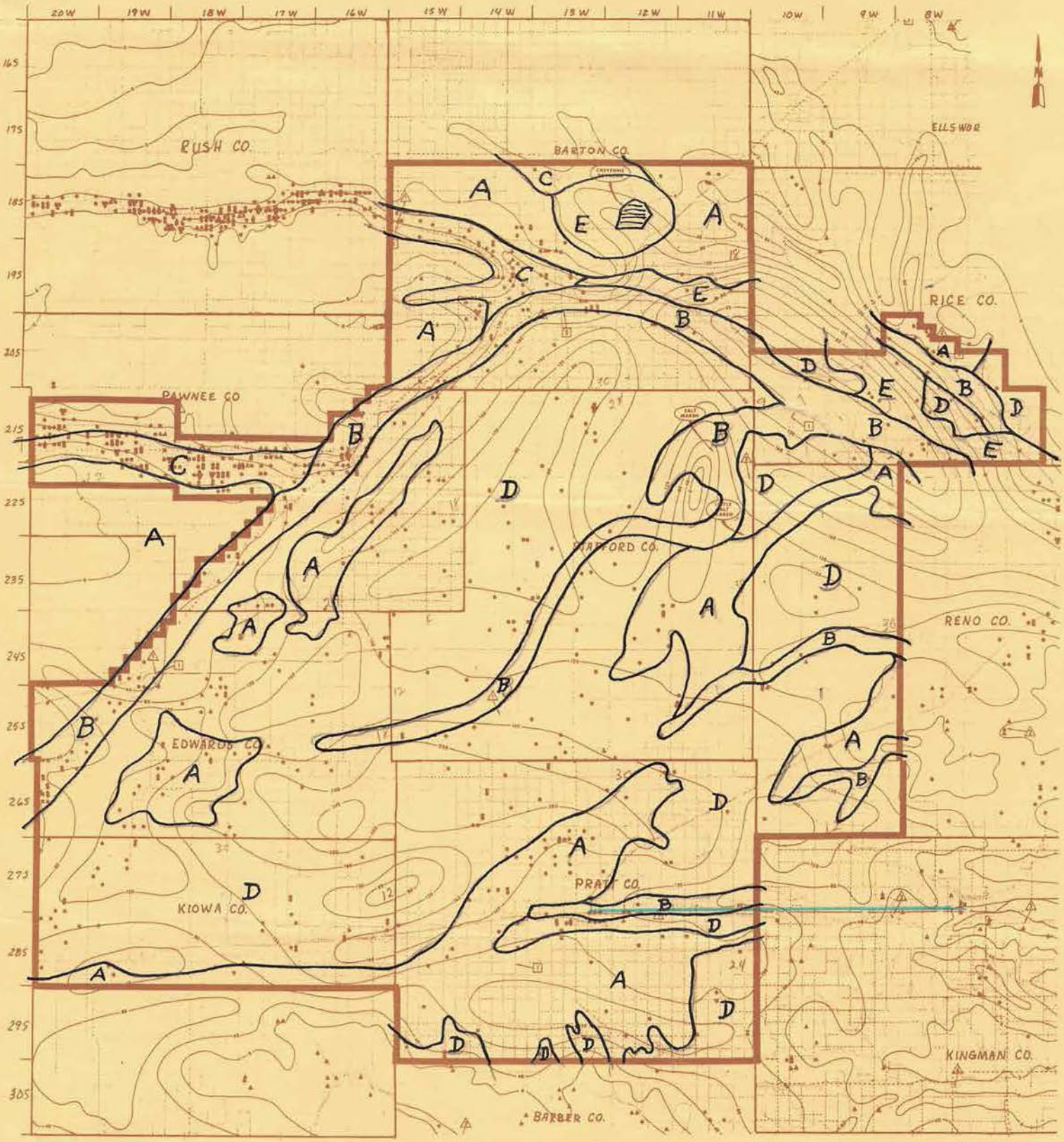

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