

# We're Running Out

February 1979

## Most Agree, Water Situation Serious

Water. The lack of it is reaching a crisis stage in parts of Kansas.

Water. In a large part, it controls our very lives throughout the state.

Water. It's important. And it's a diminishing commodity.

Water. Some claim they have solutions to the problems. Others throw up their hands in frustration.

Water. Where will it all end?

For months, reporters Martha Mangelsdorf and Karen Freiberg studied the water problem in Kansas. Their conclusions were published over eight days in the Wichita Eagle and Beacon, Feb. 4-11.

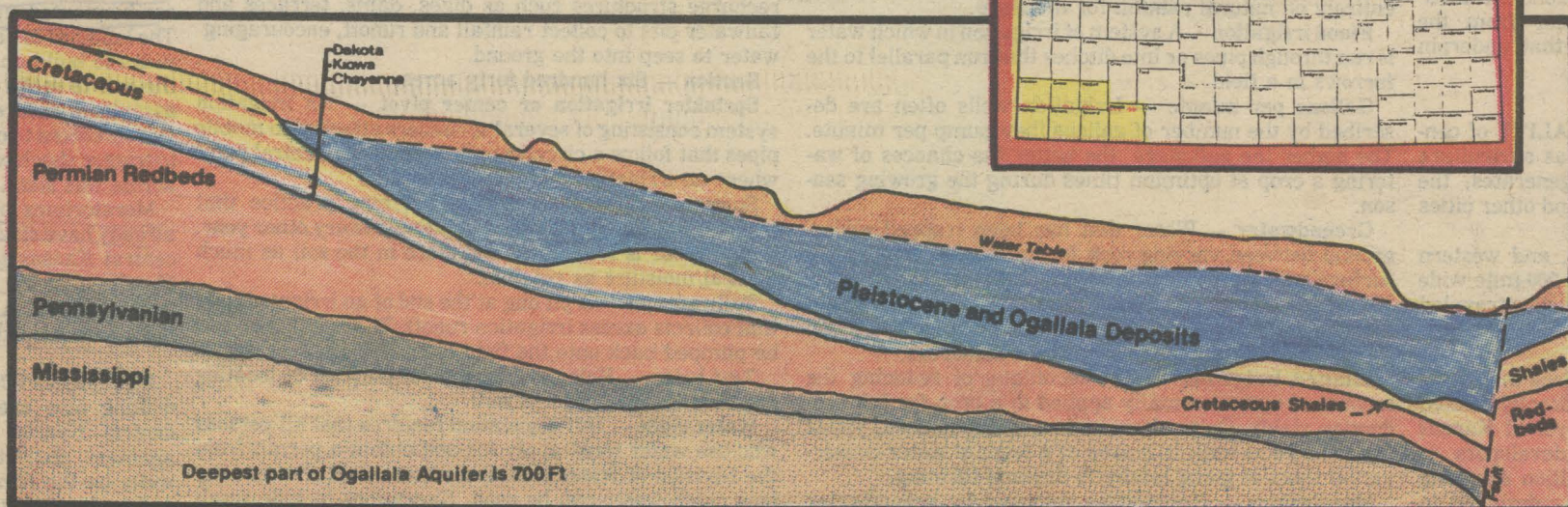
They talked with water officials, farmers, city leaders and government chiefs in Topeka. They heard a lot about problems. They heard a lot about dry wells and contaminated water supplies. They heard a lot about the economic chaos the water situation is creating. And they reported it.

They heard less about answers and solutions to the problems. Where are we heading? What can be done?

The water situation in this state is serious. And it is important. For these reasons, the Wichita Eagle and Beacon is reprinting the eight-part series in this special section.



### A Special Section of Reprinted Articles



Water formation in western Kansas. Details on Page 4.

Graphics by Judy Stanley



# OVERVIEW: Thirst Lives On as Concern of Future

By MARTHA MANGELSDORF  
Staff Writer

"We wanted to be in a free state, but I reckon there ain't no freedom here except to die of thirst," wrote one anti-slavery farmer from Missouri who moved to Kansas shortly before the Civil War.

Without water, Kansas seemed intolerably severe then — the obstinate land hopelessly unyielding. The future prospects of no water seem just as desperate to the people and the farms, towns and businesses they laboriously hacked out of this once-desolate patch of the high plains prairie.

Today, small towns near Garnett, 25 miles south of Ottawa, are hauling nearly 80,000 gallons of water a week to thirsty citizens. Garnett's main wells haven't pumped during the last three months because fall rains never came.

In northwest Harvey County, just north of Wichita, irrigators abandoned a well because it pumps too much saltwater. In southern Johnson County, south of Kansas City, a couple buy their dream home, but find they can't entertain a crowd because too many people flushing toilets strains the pump and it shuts off.

**WELL DRILLERS** in western Kansas admit business has been cut in half by moratoriums on new well development and water depletion. Bankers there study groundwater tables and depletion rates as they once studied the gold and stock markets.

But the water supply crisis is by no means limited to the far western reaches of the state.

In 10 years, Wichita must secure 5 million more gallons of water a day to meet peak demands. In 20 years, its demand for water supplies could double. Water rate increases needed to finance new pumps and pipes promise to dog Kansans into the future.

Wichita must face on a large scale what Goodland, Garden City, Hays, Clearwater, Halstead, Newton, Sedgwick, Wellington, Salina, McPherson, Liberal, Arkansas City, Augusta, Great Bend and others needing water will face on a smaller scale.

The cities are caught in an almost classically tragic dilemma. As they are forced to gobble up land and condemn water rights to quench citizens' thirsts, they take water from the farms and businesses that underpin their economies.

**WITHOUT THE VITALITY** of central and western Kansas agriculture and the business it generates, the prosperity of Wichita and other cities could suffer.

Wichita is no island, and western Kansas is more than a 200-mile wide shoulder on I-70 that must be traveled begrudgingly to Colorado vacationlands.

Fifty percent of the jobs in Kansas City are directly or indirectly related to agriculture, the mayor of Kansas City once said, and developers in Wichita plan a \$50 million shopping mall — Towne West — designed to attract shoppers from the central and western Kansas regions.

"Wichita can ill afford to lose its affluent western Kansas clientele,"



said a Kansas Department of Economic Development statistician, considering a decline in western Kansas income and buying power.

Irrigated agriculture in western Kansas means meat processing in Wichita, a booming grain elevator and milling business and a healthy rail head for shipping.

**BUT FROM JOHNSON** to Greeley counties, one can document the transition subtly under way to life with limited water supplies. The changes are sobering where they have begun.

More than 800,000 city dwellers in 200 towns across Kansas will be affected by water supply shortages during the next five to 10 years, Kansas Water Resources Board surveys show. The Ogallala aquifer — the intravenous life-support system for western Kansas fields — will be exhausted in broad areas of the high prairie.

In the next 10 years or less, individual water rights will have to be cut off or reduced across the board to stretch a paucity of supplies, one Kansas geologist predicts. Local groundwater district managers admit that water allocation may become necessary.

"In regard to the territory between the Missouri River and the Rocky Mountains, we do not hesitate in giving the opinion that it is almost wholly unfit for cultivation and, of course, uninhabitable by a people depending upon agriculture for their subsistence," wrote explorer Stephen H. Long as he crossed Kansas in 1820.

Defying Long's maps that labeled Kansas the "Great American Desert," sodbusters conquered the densely matted soil and brutal climate to hew out a state that has depended upon agriculture for its subsistence well into the 20th century.

**KANSANS HAVE** fought more than 100 years to dam small creeks and to tap rivers for water in the east. Where early settlements became ghost towns because pioneer augers "couldn't find the blue shale," determined home-

steads later struck the Ogallala aquifer in the west and the Equus Beds in central Kansas. Wells perforated the underground water reserves at such a fast clip that by 1978, water was being sucked out 20 times faster in some areas than it was recharged to the aquifer.

Farmers wrenched the most scrubby, sandy hill land from the buffalo grass, and, with water, it produced.

"It used to be you could put an ol' steer out on four acres and it'd starve in those sand hills," said one Dodge City irrigation equipment supplier. "It wasn't worth nothing until they tapped the water. Now anywhere from 130 to 180 bushels of corn grows on an acre of that rotten sand hill ground."

**THE WATER** produced an agriculture and agribusiness industry that contributes \$7 billion annually to the state economy — an estimated \$3 billion of it directly attributed to irrigation.

State economists estimate that as much as \$45 million in state sales tax revenues alone is generated by western Kansas irrigation — enough to cover total state spending for junior colleges, homestead property tax relief for the elderly and the state's contribution for special education in public schools.

But the demise of western Kansas irrigation means more to every Kansas taxpayer than just picking up the tax tab.

Many Kansas grocers buy beef in Kansas — saving enough to make the difference between T-bone steaks selling at \$2.89 a pound in Washington, D.C., in mid January, and at \$2.19 a pound in Wichita the same day, says

the Kansas Department of Economic Development.

**MORE THAN 200** meat-processing and packing plants are tucked in towns as far east as Kansas City. Upward of 22,000 of their employees depend on western Kansas feedlots that are married to a steady supply of grain.

Irrigation guaranteed steady corn and milo breakfasts that fatten a million head of Kansas cattle annually. Feedlot operators say they can substitute milo and wheat for corn, which may require longer fattening time on the lot, or import corn which could raise costs.

Western Kansas farmers are abandoning altogether or dedicating fewer acres to the water-guzzling crops like corn. Corn plantings in Kansas will be down 7 percent this year, the Kansas Crop and Livestock Reporting Service says, although corn acreage will be up 1 percent nationwide. Spring milo plantings are projected to be down in Kansas 4 percent this year and the reporting service says the reason is largely water shortages.

With the fertilizer, the disease-resistant hybrid seeds and the irrigation, western Kansas farmers and the feeders and packers thought they had built a fail-safe system to beat the summer sun that can blister crops like a blow torch. They didn't.

The question is now whether the feeders, packers and other businesses will be as resolute as the farmers to stick it out.

**FOR MONFORT**, a Colorado-based beef packer, and others, it's been nip and tuck finding enough water to build in Kansas — a million gallons a day, plus fire protection and city water hookups for new employees.

Monfort had to devise an elaborate waste water treatment and recycling plan to convince a farmer near Oakley to let the proposed plant use his water. Stringent well-spacing restrictions prohibited sinking new wells near the plant site, so Monfort proposed recycling the precious water back to the farmer's irrigated acres.

Farmers figure they roughly double their incomes with irrigation. But going back to dryland practices can cut income to one-fourth in some areas because a dryland crop often can be planted only every other year. The land has to lie idle once every two years to build up enough moisture in the soil to make a stand against the assaults of nature. The loss of irrigation threatens to cut buying power and to trigger shock waves that will ripple across this state.

Moratoriums on new well drilling already have closed one fourth of west central Kansas to development, and 56 percent of the applications for new water rights in southwest Kansas have been denied since July.

**BUT MORATORIUMS** on new well drilling also are being imposed in central Kansas groundwater management districts where too many wells on the fringes of the aquifers pull so hard that they displace fresh water and invite ruinous saltwater into the supplies harbored for

(See THIRST, Page 4, Col. 4)

## What Water Terms Mean

*Editors note: Following are definitions for terms that appear frequently in the series on the water situation in Kansas.*

**Aquifer** — An underground waterbearing formation of rocks, sands and gravels created in early geologic periods. In Kansas, the porous formations were filled with water from rains, snows and melting glaciers over a long period of time.

**Acre foot** — About 326,000 gallons. The amount of water it takes to cover one acre of land one foot deep.

**Dryland** — The type of farming where crops depend entirely on natural rainfall for moisture.

**Flood irrigation** — A system of irrigation in which water is run through pipes or into ditches that run parallel to the furrows in a field.

**Gallons per minute** — Irrigation wells often are described by the number of gallons they pump per minute. The higher the gallonage, the better the chances of watering a crop at optimum times during the growing season.

**Groundwater** — Water that has been trapped underground between varying rock formations, as opposed to surface water prevalent in rivers and streams.

**Groundwater management district** — A political subdivision of the state of Kansas formed by landowners and water users to manage groundwater resources.

**Limited irrigation** — The technique of reducing the amount of water normally applied to a crop for full production yields. Quite often, as less water is used, yields are reduced as well. It is used as a form of water conservation short of going totally to dryland farming.

**Moratorium** — Restrictions imposed by groundwater management districts and the chief engineer of the Division of Water Resources that prohibit new wells from being drilled in areas where water depletion has been defined as critical.

**Pre-irrigation** — The practice of applying water to a field several months before planting a crop. The water soaks into the soil where it is stored until the plants need it during the growing season. Farmers whose wells no longer pump sufficient amounts of water for full irrigation during the growing season might turn to this as a way of ensuring that crops will have moisture.

**Recharge** — The process of replacing the water withdrawn from an aquifer. This occurs naturally when rainwater or runoff from rivers and streams percolates through the various strata of rocks. Farmers also build recharge structures such as dikes, dams, terraces and tailwater pits to collect rainfall and runoff, encouraging water to seep into the ground.

**Section** — Six hundred forty acres.

**Sprinkler irrigation or center pivot** — An irrigation system consisting of several sprinklers attached to mobile pipes that follow a circular path around one central point where an irrigation pump is located.

**Summer fallow** — A dryland farming practice that leaves a field standing idle or unplanted every other year. The purpose is to capture and store in the soil as much natural moisture as possible.

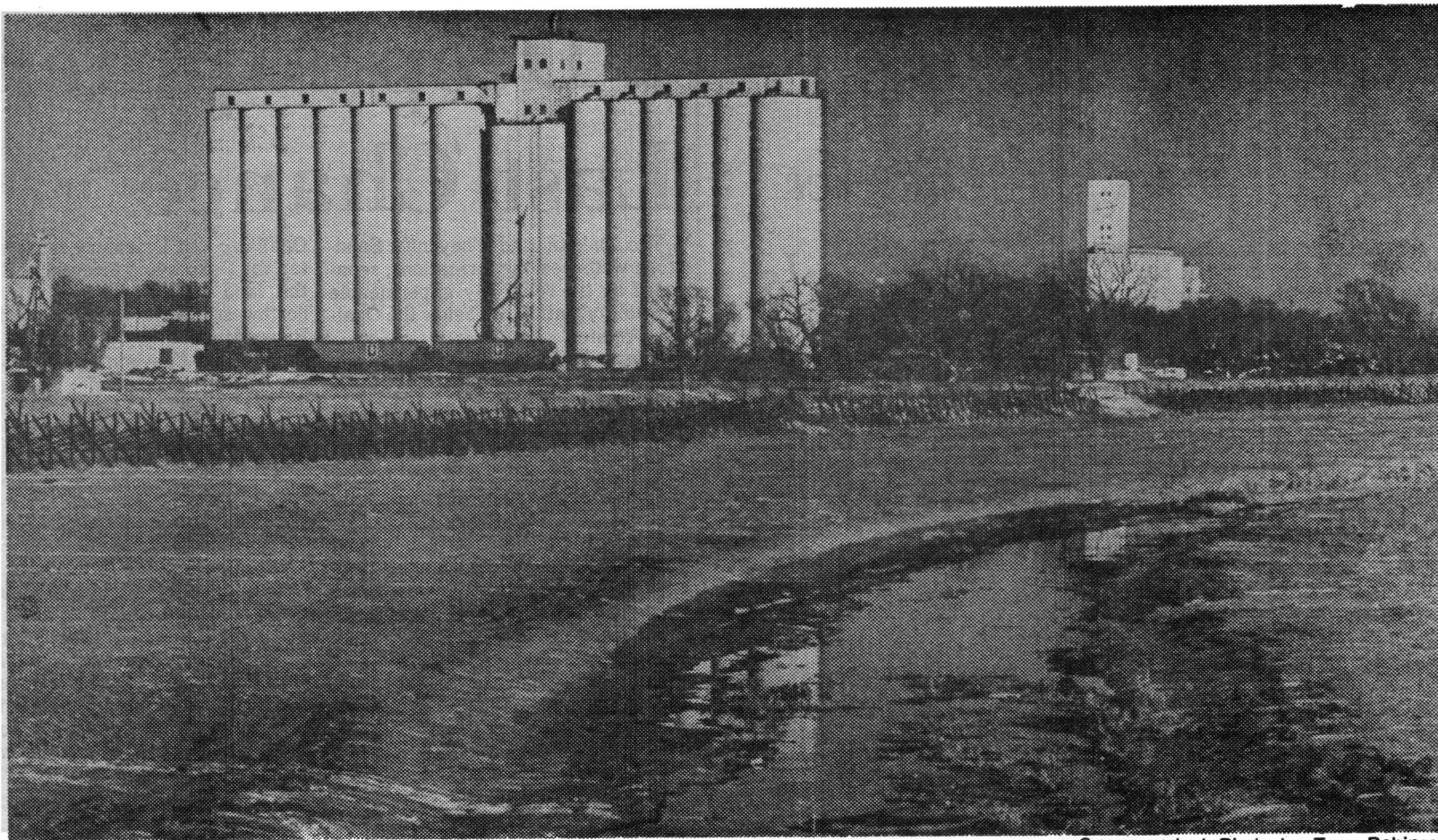
**Tailwater pit** — A pit dug at the end of an irrigated field that collects excess irrigation runoff. The water then can be pumped back onto the field later.

**Test holes** — Holes drilled for the purpose of locating groundwater to tap for a well.

**Water right** — 1977 legislation requires that all persons who use water must apply for and obtain a permit from the Division of Water Resources that establishes exactly how much water can be used. Exceptions include small domestic uses, small water uses from reservoirs and water bought under contract from state reservoirs.

**Water table** — The level of underground water; the level below which the ground is saturated with water.





Correspondent Photo by Troy Robinson

Arkansas River  
flowing through  
Dodge City is  
only a trickle

# WEST KANSAS: *Was Irrigation a Blessing?*

By KAREN FREIBERG  
And MARTHA MANGELSDORF  
Staff Writers

Like giant metallic insects, the steel-spined irrigation systems seem rooted in the western Kansas countryside.

Whether they stretch above the corn stalks and milo stubble or burrow hundreds of feet into the clays and sands beneath, their mouths are anchored to a common prey — the Ogallala aquifer.

In 1950, the Ogallala was thought to be the source of an unending supply of water. Farmers felt safe in drilling into its depths, tapping the juice that transformed the dry browns of semi-arid rangeland into a garden of shimmering green corn.

**TODAY, THE** Ogallala, like a great rock sponge, is being wrung dry from three decades of continuous irrigation by an ever increasing swarm of pipes and pumps.

As wells begin to sputter dry, so does the economy in the 24 counties of western Kansas that carries the brunt of the irrigation industry.

Along with the dropping water table, the \$3 billion irrigation industry — based on a corn economy — is dropping off, too. Where water supplies are becoming critical, impending shortages threaten to undermine gross incomes directly attributed to irrigation — \$34 million annually in Finney County; \$28 million in Grant; \$22 million in Scott and \$27 million in Wichita County.

The groundwater situation in western Kansas has put farming there on the threshold of dramatic change. Some farmers think that the look of the land will alter in the next two to five years as drastically as it did in the mid-1960s.



**THEN, THE** movement of feedlots into that area and the increased demand for feed grains, especially corn, spurred an industrious expansion of irrigation. Because corn requires twice as much water as grain sorghum and four times as much water as wheat, the great strain on water supplies peaked.

For some farmers, it has all become a Catch 22. They borrowed against what irrigated corn promised to

translate into dollars. But the corn gulped water and the water table plunged. To extend the life of the water supply, farmers yearn to reduce corn acreage or abandon it. But the limited irrigation milo and wheat will not service the debt corn incurred.

Still, the gut-wrenching decisions have to be made because the water is all that keeps farmers one up on the ceaseless wind that conspires with the scalding sun to kill a crop in western Kansas.

"We'll never grow corn again," promises one Scott County farmer, estimating that his water supply is 75 percent depleted.

"We've gone strictly to milo. No more corn," says a Kearny County farmer.

Other changes for western Kansas farmers are less visible, more apparent to the pocketbook. The value of irrigated land, once worth twice as much as dryland, declines with the water table.

"I wouldn't give a penny for irrigated ground here," said one farmer in west central Kansas who has 800 acres under irrigation.

The reason: A moratorium on irrigation development in that area indicates that water is so short that future yields and profits may be jeopardized.

"It's a gradual movement — like a cloud across the sun," says Roy Bogle, Kansas State University agriculture economist. "Soon irrigation will be blotted out."

State water resource experts predict that irrigation will be nothing but a memory in many large areas of west central Kansas in eight to 10 years. They give northwest Kansas

about 15 years and calculate that southwest Kansas will lose the bulk of its groundwater acreage during the next 40 years.

The problem stems from farmers, towns and industries taking more water out of the ground than is returned to it. Groundwater district managers in western Kansas estimate 4.5 million acre feet (1.4 trillion gallons) of water is taken out of the aquifer each year.

**RAINFALL, MEASURING** 14 to 19 inches annually, and runoff from rivers and streams returns only about 316,000 acre feet of water (103 billion gallons) to the underground reserves.

In west central Kansas, the Ogallala is shaped like a shallow saucer. In Groundwater Management District No. 1, 3,000 irrigation wells are like straws sucking water out of the saucer about 20 times faster than nature restores it. Wells in the center of the saucer might range from 100 to 200 feet.

As the water level has dropped — as much as 34 feet in the last 25 years in Wichita County alone — irrigators on the saucer fringes, where the water is receding and those in shallow pockets created by uneven underground rock formations, see wells go dry.

In northwest Kansas Groundwater Management District No. 4, the story is much the same. Well depths there range from 100 to 200 feet, but the water table is generally higher because there has been a shorter history of pumping.

**BY CONTRAST,** Southwest District No. 3 enjoys a deeper formation in the aquifer, ranging from 100 to 700 feet. And a second aquifer below the Ogallala in this area, the Dakota, is giving new hope to irrigators who can afford to pump water the added distance.

In 1972, the Kansas Legislature authorized the creation of groundwater management districts to give local people control of their water use destinies. Under more recent legislation, the districts are appealing to the chief engineer of the state's Division of Water Resources to declare parts of the districts critical groundwater depletion areas. Such a declaration freezes new well drillings.

Local restrictions and declared moratoriums halt the granting of new water rights in critical areas more and more frequently. The districts also have set strict well-spacing regulations.

In the southwest district, for instance, new drilling rights are being denied where all wells in nine sections around the proposed new well would deplete the aquifer more than 40 percent in the next 25 years.

"**FORTY PERCENT** is the rate at which, when you've exceeded it, you've created serious long-term problems," explained David Pope, former manager who became assistant to the state's chief engineer in October.

"Twenty-five years was set as a sufficient period to amortize investments. Fifty-six percent of the inquiries for new water rights between July and October when I left could not be approved.

"It's having a very substantial effect — very significant in terms of future development. It can't solve the problem of running out of water. But we just had to put the brakes on so it would not get worse at a faster rate."

In the southwest district, the critical water-short areas include northwest Finney and northeast Kearny counties where the Ogallala was more shallow.

(See WAS, Page 4, Col. 1)



# Was Irrigation A Blessing?

★ From Page 3

"ALONG THE Arkansas River they are out of water, and in some isolated areas of mid Gray County," Pope said.

In the southwest district, any new well pumping more than 400 gallons a minute must be spaced 2,300 feet from any other well.

In the west central Kansas district, Manager Keith Lebbin said well spacing is based on the estimated depletion of the stored groundwater since 1950. About one-fourth of the district is closed to new development.

Lebbin said areas 10 percent depleted or less require that wells be spaced 1,320 feet apart and where 40 to 50 percent of the water is gone, they must be a half mile, or 2,640 feet, apart. When more than 50 percent of the water has been sucked out, no new wells can be punched in the aquifer.

"A NUMBER OF farmers I talk to say the management plan is all fine and dandy, but it's like closing the gate after the horse is gone," Lebbin said. "You could stop drilling in the entire district and you still couldn't save the aquifer. A lot of areas here, we can't help at all because they're already too far gone."

Lebbin's district has cause for concern. Overall, one-third of the water stored in the Ogallala in that district in 1950 has been pumped out, and the depletion rate increases with more wells.

West of Dighton and southwest of Scott City, the water is gone, Lebbin said. West of Leoti, 77 percent of the water is gone and the town is faced with finding new well sites to maintain supplies. More than half the water is gone in 13 large areas of the district.

"The Dakota just is not too promising for us here," Lebbin said, noting that that aquifer must be tapped by wells fingering down about 1,000 feet or more.

The water that had put 4,922 acres in the district under irrigation by 1922 and 391,000 acres under irrigation by 1978 will last an average of about eight to 10 years, barring any new development, Lebbin concedes.

"I don't know what people out here are going to do," he says. "It's going to get awful thirsty."

Wayne Bossert, District No. 4 manager, said his northwest counties define a critical area for no further development as one that has been depleted of 20 percent of the water available in 1966.

"We're looking at what may be our first control area now, the area around Goodland and to the southwest," Bossert said. "The worst situation is southwest Sherman County and it's getting critical south of Colby and west of Hoxie."

"The parts we may propose as critical areas have good irrigation potential, but, unless they're taken out, it will cut the throats of the rest of the district."

Bossert said he has seen wells go down in his district "that beyond a shadow of a doubt won't pay off" because the water won't last the 30 to 40 years it will take to pay off the average new system loan.

"Short of a total reduction in water rights, our goal is to cushion the return to dryland farming," Bossert said. "We're pumping at seven times the recharge rate. With no action, we could pump the water out in 10 years at the rate we're going."

**WELL SPACING** in District No. 4 sets distances ranging from 2,000 feet between new wells pumping under 500 gallons a minute to 3,100 feet for wells pumping more than 1,200 gallons a minute.

Many farmers say the bottom gallonage on an irrigation well is 200 gallons a minute before it is no longer profitable to pump. Stories abound of wells that pumped 1,000 to 1,500 gallons a minute in the 1960s, but only pump 200-300 gallons now.

In cases like these, many farmers have resorted to tying several small wells together by underground pipe to increase gallons pumped per minute and to keep enough pressure to run a center pivot irrigation system.

"The Division of Water Resources people failed to foresee the problem we would face," said one state water resource expert. "If they had just been looking at the exponential growth of irrigation, they should have seen it."

**BUT A WATER** Resources Division spokesman insists that the division should not have to shoulder all the blame for the laissez faire manner in which the state's water rights laws were administered.

From the state politicians to the local irrigation districts and farmers, he says, people insisted that individuals should manage their own water and the state should keep hands off.

For nearly three decades the division took no aggressive role in managing the vital water resource, bowing to what it believed was the prevailing water management attitude and the water table plunged precariously low.

Water resource experts still turn a critical eye to the 1945 water appropriation law and policies, arguing that it is fuzzy and seems to encourage users to use all the water they request or face the possibility of having a right reduced.

Policy also is gray on whether supplemental well drilling to maintain original well yields can be tolerated.

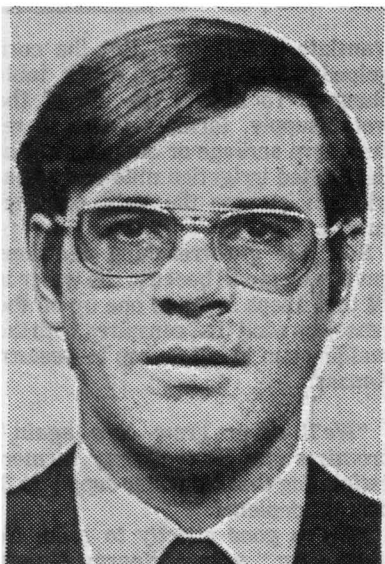
"FOR YEARS, the chief engineer approved virtually every water application that came into his office and he over appropriated the water we had out there," one water resource official said. "I would venture to guess he never even knew how much water they had in western Kansas until recently."

Rules and regulations interpreting how the state's 1945 water appropriation law would be implemented were adopted and became effective only last May. The law had been on the books 33 years.

## Water District Officials



KEITH LEBBIN  
... District 1 chief



DAVE POPE  
... Ex-District 3 chief



WAYNE BOSSERT  
... District 4 chief

# 2 Deep Aquifers Last Chance

The Dakota and Cheyenne Sandstone waterbearing formations, separated by the relatively impermeable Kiowa Formation, lie below the Ogallala Aquifer.

Kansas geologists estimate that the Dakota and Cheyenne may give up 70 million to 80 million acre feet of water. An additional 10 million to 15 million acre feet may be available if desperate demands and technology make desalinization economically feasible.

The deeper aquifers stretch beyond the boundaries of the Ogallala into central Kansas, where they are closer to the surface and tapped primarily for domestic wells or to supply stock tanks. They tend to give up water more slowly than the Ogallala because they are tighter geological compositions.

In extreme southwestern Kansas, the deeper aquifers mesh with the

Ogallala, and irrigators successfully tap the Dakota and Cheyenne. But as the land in the west central and northwest Kansas rises toward the Rocky Mountains, the distance to the Dakota and Cheyenne makes pumping out of the question. The deeper aquifer water is 1,000 to 2,600 feet below the surface and often poor quality.

The deeper aquifers generally are regarded by state geologists and groundwater managers as last chance water supplies for cities.

The small city of Jetmore, in Hodgeman County, already takes its water from the deeper aquifers but, warns the Kansas Geological Survey, "extensive development or irrigation wells that yield 500 to 1,500 gallons per minute in local areas of northern Ford and southern Hodgeman counties have caused changes in this water table."

## Thirst Continues as Concern of Future

★ From Page 2

hundreds of thousands of people, including Wichitans.

In northwest Harvey County, Edwin and Phil Schmidt are abandoning an irrigation well that should have lasted another 20 years because it pumps too much saltwater, which can bind the dirt so tightly it will never again accept water.

Western Kansas bankers have begun reducing the amount they will loan on a western Kansas irrigation operation they think may not last long enough to pay the debt.

Irrigated land prices are plunging in places where the water won't last. Land, once demanding a price reflecting potential irrigation development, now sells for half — at a dry-land price.

Generally, when water resource officials speak of western Kansas running out of water, they mean it will become so costly to pump deeper or longer to get water to parched crops that irrigators will be forced out of the business, still leaving enough water for cities and rural homes.

But, says Wally Robinson who farms west of Scott City, the wells there were on the bottom of the Ogallala a decade ago and now they are notched into the shale floor in an effort to drain every drop the vast underground plumbing system will give up.

**KANSAS IS** living on borrowed time as a utopia where the water will last forever, state planners and water resource officials say.

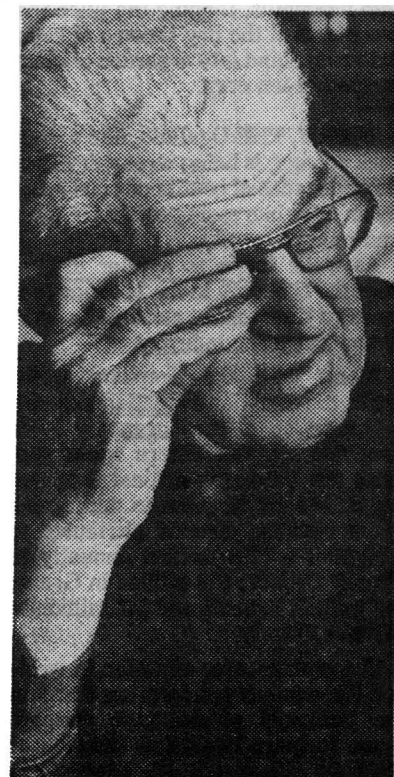
The state has no contingency plan setting priorities for who will have water when supplies will no longer meet demands and must be allocated.

Some argue that the state's 1945 water appropriations law has encouraged users to pump all the water they request or face a reduction in the

water-use right. City water rates encourage consumption with cheap pricing.

In many cities it will ultimately come, sooner than many believe, to condemning water rights. But farmers promise "the worst range war you've ever seen."

Ironically, notes one state water resource expert, "We've been handling water appropriations, rights and certifications by the seat of our pants. We've had the ability to limit water usage based on whether it would unreasonably raise or lower the water table. It was never called upon until the last couple years."



EDWIN SCHMIDT  
... Harvey County farmer



# WICHITA:

## Irrigation, Growth Threaten Area

By MARTHA MANGELSDORF  
Staff Writer

Down the road, water will be a limiting factor in this area, says Tom Bell as his arm sweeps a map of the Equus Beds — the aquifer that each day offers up water to people in Sedgwick, Harvey, McPherson and Reno counties.

The 29-year-old geologist and ground water district manager must make the decisions today to lessen water shortages threatening hundreds of thousands of people tomorrow.

For Bell and Rick Sloan, manager of the Big Bend Prairie Groundwater Management District No. 5 — a region which covers all or parts of eight counties to the west of the four-county Equus Beds region — huge underground formations of salt and saltwater produced decades ago by oil recovery operations are also a ruinous force to be reckoned with.

And the dwindling freshwater supplies are threatened by growth — by Wichita which needs to double supplies to cover demands in the next 20 years and by smaller towns such as those in Harvey County.

A Harvey County task force has just completed a contract study which shows that Newton, Sedgwick and Burrton must hustle to find additional water rights to meet projected growth in the next 10 to 20 years.

**UNCHECKED business, irrigation and population growth, the task force says, is expected to increase water needs from 57,467 acre feet in 1980 to nearly 97,000 acre feet in 20 years. But the Equus Beds recharge in Harvey County amounts to about 88,700 acre feet annually and proposed restrictions in the groundwater management district are aimed at holding water withdrawals at the recharge rate.**

"At some point, there will have to be a ceiling on wells and no more wells will be approved in this district," Bell says. "Somehow, we've got to limit the wells. And if we get to the point we have all the wells we're going to have, then no new industry or large water users will be able to come in until there's a way to get more water."

Bell and Sloan may both have hit on a formula to stall new well drilling and growth that hinges on a water supply.

On Jan. 5, the chief engineer of the Kansas Division of Water Resources approved revisions in Sloan's management plan that propose a circle with a two-mile radius be drawn around the point of any new well application. If water withdrawals from all wells in that circle and the proposed new well will exceed recharge, about 6,000 acre feet annually, the new application will be denied.

A PUBLIC hearing was held Feb. 8 on District 5's proposal. It will then be subject to final approval by the district's governing board.

Bell has a similar proposal pending for his district, subject to a public hearing and board approval by early spring. It would limit well withdrawals in a two-mile radius of any proposed well to 4,025 acre feet annually.

On the surface, it seems odd that the

much freshwater is displaced because recharge and use are not balanced, saltwater can move in and destroy remaining good water. It cannot be removed by conventional means.

"**THE APPROPRIATED** rights to take the water in this district are 220,000 acre feet now and if everyone pumped the amount allocated, they would be pumping twice as much as comes in," says Bell.

There are only about 45,000-47,000 irrigated acres in the nearly 500,000-acre Equus Beds District and, says Bell, "one half to three fourths of the district is potentially irrigable if water is available. We could in no way support that much irrigation."

Sloan says 75 percent of the wells that were drilled in Kansas the last 10 years went down in his Big Bend Prairie District.

"We have about 500,000 acres under irrigation of the nearly 2.5 million acres in the Big Bend District and if nothing is done, I imagine every acre in the district would eventually be irrigated," Sloan says.

That would spell disaster for the water table in the district. If the district were irrigated to the maximum, as much as 3.7 million acre feet of water could be pulled from the aquifer that recharges with only about 1.16 million acre feet of water each year. Current withdrawals are about 800,000 acre feet.

**THE DISASTER** for both districts, however, could be of much larger proportions.

As inland seas evaporated more than 200 million years ago in Kansas, they left a sizeable salt deposit in the state's heartland — the Hutchinson Salt Member of the Wellington Formation and the Cedar Hills and Sand Plains formations further west. As glaciers melted in the ensuing ice ages, central Kansas' porous soils were filled by the melted water, snows and rains to form freshwater aquifers above the salt.

There's another source of the saltwater that can move east across the Equus Beds and the Big Bend Prairie District's wells. It's the highly con-

centrated brine produced from oil recovery activities.

An estimated 450 million-600 million barrels of brine are produced annually in Kansas. Mel Gray, director of the Kansas Division of Environment, says that one gallon of brine can ruin 500-600 gallons of fresh water.

When the oil is brought up, it is separated from brine and stored in tanks. Back in the 1930s and 1940s, it was common practice to dispose of the salt brine in large surface evaporation ponds.

**BUT THOSE** pits were outlawed in the 1950s, and oil producers were forced to dispose of the polluted water in deep underground injection wells. The evaporation ponds still plague farmers, forcing some to abandon irrigation and house wells because they pump too much saltwater.

"Improperly plugged test holes, abandoned oil wells with corroded casing and disposal wells with corroded casing also provide a source of saltwater," Bell says. "These holes provide a means for saltwater to travel from very deep formations up into the Equus Beds."

Sloan says his district is working closely with the Kansas Department of Health and Environment to clamp down on careless oil field operators who allow saltwater to spill across the land during regular pumping.

In the Equus Beds, the saltwater intrusion problem is most evident near Burrton, in northwest Harvey County, north of Halstead and along the Arkansas River.

"One of the biggest concerns is that increased pumping in freshwater areas in the Equus Beds will lower the water table enough to induce the saltwater to move east into the freshwater," Bell says. "Once the saltwater moves in, the freshwater supply is permanently destroyed."

**THE SALT** moves west to east in the Big Bend Prairie District and, as in the Equus Beds, from deep water to shallow.

"In our district, the line runs roughly along Highway 281," Sloan said. "Groundwater to the west is

good quality. Irrigation is more dense in the west, but more development is under way now in the eastern part."

Both districts are working with the U.S. and Kansas Geological Surveys to put test and monitoring wells down as early warning defense lines to salt-water movement.

KGS studies are also trying to forecast how much stress can be put on the aquifers with new pumping before it will cause the salt to move.

Twenty wells have gone down at eight sites in Sloan's district and about 100 more wells at 44 sites must be drilled. Bell plans to have 82 wells drilled in western Harvey and eastern Reno counties by summer's end to track the salt migration. That project is being funded by the Harvey County Commission, and Wichita is contributing drilling rigs and crews to the effort to save the water supplies.

**IN ADDITION** to the two-mile radius proposal, both districts have appealed to the chief engineer to declare complete moratoriums on taking any more water in a 56 square mile area around McPherson and Conway Springs in the Equus Beds and the portion of Pawnee County in District No. 5 from the Pawnee-Hodgeman county line to just west of Larned.

"Since 1966, we've seen drops in the water table of 11-12 feet, especially in the Burdette area, despite recharge," Sloan said.

In the Equus Beds area, the drops have been as much as 20 feet since 1958 just west of McPherson where depths of water range from 40 to 160 feet. There, an application by Midwest Underground Storage Inc. for three wells and water rights for 2,078 acre feet of water annually prompted the moratorium. KGS geologists predicted that if granted, the Midwest application could have lowered the water level in the Conway area by 16 feet in the next five years.

The moratoriums are in effect until the KGS can develop complex projections to predict exactly what will happen to water tables and salt movement under varying intensities of water drawdown.

**FARMERS** in the area, says Bell, "knew the water table was declining, and they say they sure hope the moratorium isn't lifted."

Says Sloan: "The majority of individuals say it's about darn time something was done."

Bell says that with efforts to balance recharge and water pumping, the water in the Equus Beds and Big Bend Prairie districts could last forever, theoretically.

"You can stop the growth, but still have a sound economic base," Bell says. "If you use the water up, there is no economic base. Nothing will be of any value without water."

For Sloan and Bell, the drawdowns and the salt intrusions are only part of a plethora of problems they face managing a water supply.

Very few irrigators are using meters to gauge exactly how much water they are pumping of the 1.5 acre feet per acre they are allotted each year.

"The only way we can manage the

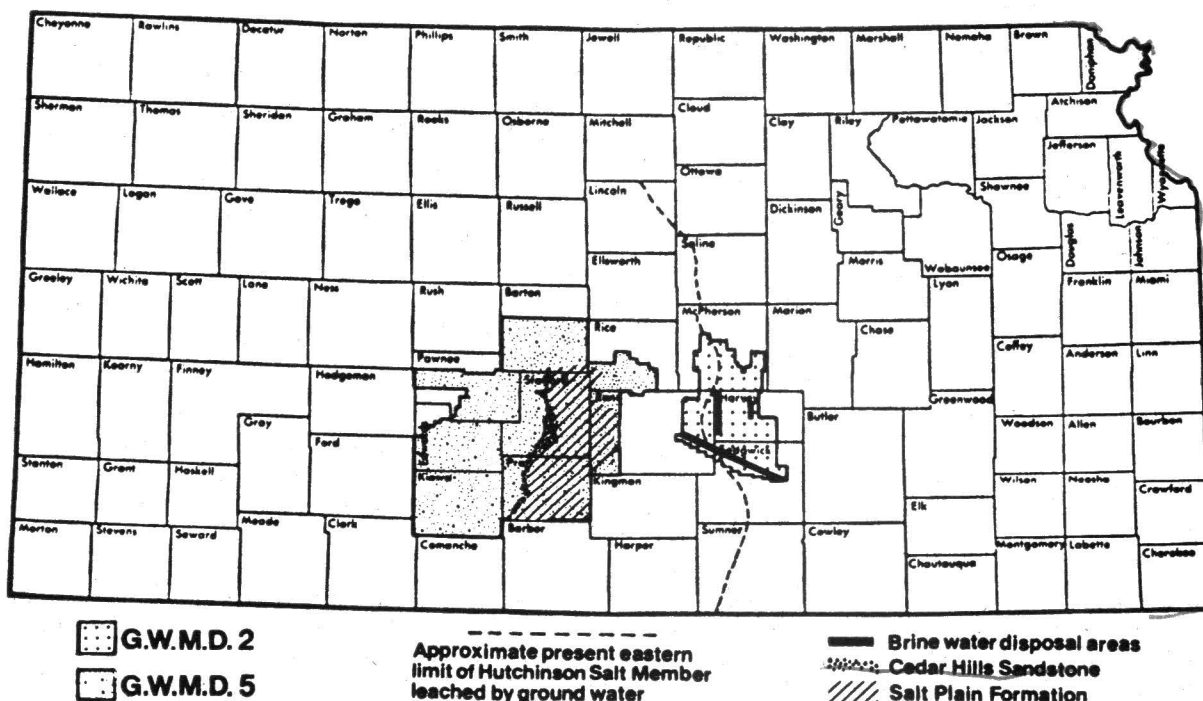
(See WICHITA, Page 8, Col. 4)



districts are adamant about limiting irrigation, industrial development and the growth of cities.

Unlike the tight clays of western Kansas that send most water skittering across the surface and on to streams, or hold it on the surface to evaporate in the summer, sands and more porous soils in central Kansas allow rainwater to percolate back into the aquifers.

But as Bell and Sloan pore over geologic maps, they are worried by projections that water use will double in 20 years — to demands of 210,000 acre feet annually in the Equus Beds District. Recharge throughout the beds averages only 100,000-120,000 acre feet a year and existing pumps already pull about 100,000 acre feet out of the aquifer annually. If too





# Contamination Eye-Opener for Schmidts

"We've gone through a lot," says Edwin R. Schmidt who, with his son Phil, farms about 700 acres in northwest Harvey County.

One 700-gallon-a-minute pump that watered 120 of their 300 irrigated acres of corn and milo began pumping saltwater, and the Schmidts think that it is a result of old oil field brine disposal ponds under their property.

Standard allowable salt content, Phil said, is about 25-100 parts per million parts of water. But the well pumped 800-1,000 parts per million salt. When the Edwin Schmidts tried to locate a well further from the contaminated irrigation well, test drilling produced saltwater of more than 3,000 parts per million at 85 feet depths.

"WE DIDN'T know we had any problem here until the new house and then we got an eye opener," the senior Schmidt recalls.

On Phil's portion of the farm "we've decided to abandon, for the first time, an irrigation well. It produced for 20 years and it was expected to last about 40."

The Schmidts began noticing the salt levels at the irrigation well in 1973. Testing showed 600 parts per million salt. By 1978, it was averaging 800-1,000 parts per million salt.

"Our concern was the severe build-up of salt and sodium in the soil," Phil said. "It was so dry last year and we used so much water. It attaches to the clay. It won't leach on through. Pretty soon, the land won't take water. We had to move it before it affected our yields."

EDWIN SCHMIDT had received delivery on new irrigation equipment to expand irrigation another 200 acres. But when they began test drilling to locate that pump for the new center pivot system, all they found was saltwater. Schmidt was forced to scuttle expansion plans and return the equipment.

"My biggest concern is whether we'll be able to continue irrigating," Edwin Schmidt said. "You build your operation around irrigation and the potential for irrigation. You only set up the program once. That's the only chance you get."

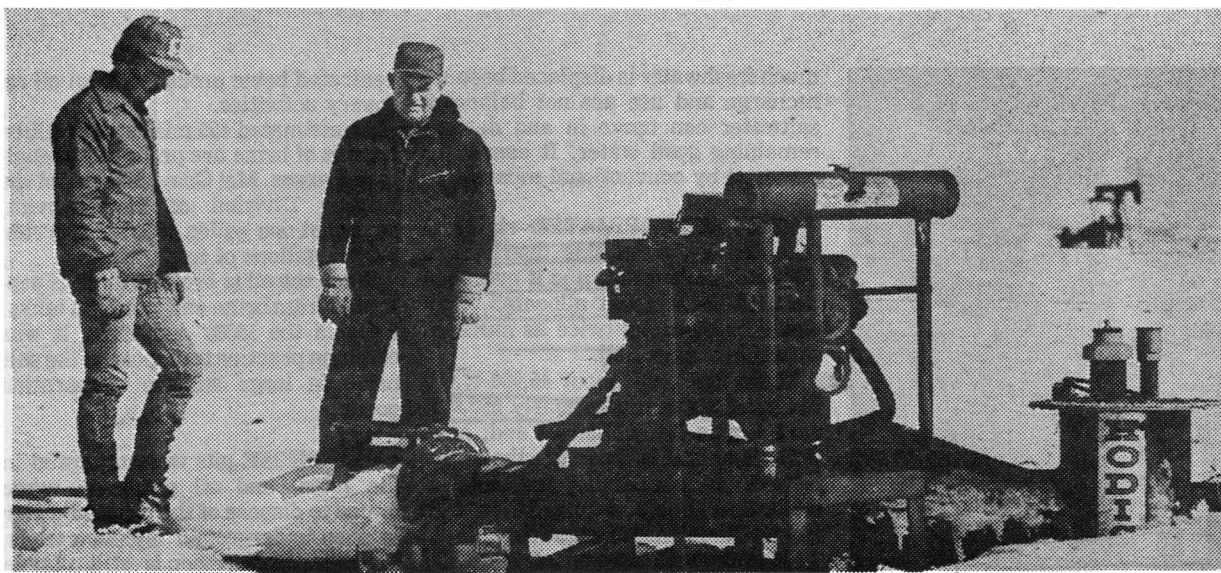
"It cuts into your income. I'm getting ready to retire. I just hope Phil doesn't run into more difficulty."

For Phil, abandoning the existing well means spending another \$25,000 or so to move the well and pipe back to the field, if the management district well spacing restrictions will allow that. It's been allowed up to 1,300 feet, Phil said, but he has to move 3,000 feet to find good water.

"IT AMOUNTS TO reinvesting in the same thing that we'd paid for once to keep up irrigation," Phil said. "But I guess you come to expect something like this in the farming business. Just about the time you think you're on your way to success, something comes and takes it out from under you."

The chances of expansion?

"Our one effort represented maybe a \$60,000 investment for that high a salt reading and it was just too risky,"



Staff Photo by Renee Bodine

Phil and Edwin Schmidt inspect well

Phil said.

And the dreams?

"Normally, we figure we can double the gross income per acre by irrigation," Phil said. "We figure you can

grow \$280 an acre at a cost of about \$150, while dryland wheat grosses \$120 at a cost of about \$60. For us, it also means my wife can't quit teaching school."

For Phil Schmidt, the outlook for his farming operation is troublesome.

"It concerns me down the road because we don't know how much the salt will spread," he said. "I think

what Tom Bell (manager of the Equus Beds Groundwater Management District) is doing will help so we don't deplete the Equus Beds water table and see this salt move."

## McPherson Big Water Saver

By MARTHA MANGELSDORF  
Staff Writer

As Equus Beds water tables dropped and moratoriums loomed, a major water conservation campaign in McPherson met with dramatic results, says Tom Bell, manager of the Equus Beds Groundwater Management District.

Daily consumption was reduced about a million gallons or nearly enough to irrigate three acres of corn for the entire growing season for each day of the savings.

Wichita, by contrast, delivers about 42 million gallons more of water during peak usage periods than it does on an average daily basis. The difference in daily demands and peak use is enough to irrigate nearly 128 acres of corn for the entire growing season for each day of the savings.

"THE PRESENT THINKING is backwards," Bell said. "Water rates are turned around. It should cost more to use more water, not be cheaper."

Despite the McPherson savings, water pricing, is the only way to realize real and lasting conservation, said Wichita Water Director John Wynkoop. In mid-January, the Wichita City Commission gave Wynkoop 60 days to develop a detailed water conservation plan to be held in reserve until the thirsty city is forced to enact it.

"We'll develop some alternative rate structures, perhaps pricing water higher in the summer in peak irrigation season," Wynkoop said. "Dallas initiated that about two years ago and it's been pretty effective in reducing consumption."

Wichita has a rate structure that varies with use, according to Wynkoop. A residential customer who uses 3,000 gallons or less of water pays 88 cents for each 1,000 gallons of water.

AN AVERAGE homeowner uses 6,750 gallons a month. He pays about 86 cents for each 1,000 gallons of water.

Industrial customers, because their demand throughout the year is constant, pay less. An industry using 1 million gallons would pay about 37 cents for 1,000 gallons. And an industry that uses 10 million gallons would pay 30 cents per 1,000 gallons.

Efforts to force people to conserve prematurely can boomerang, Wynkoop contends. Today, there is enough water to supply Wichita's needs. If people conserve, he says, they will see little for their efforts and be discouraged.

"There are fixed costs right now, interest on bonds, meter readers and other costs regardless of how much water we're using," Wynkoop said. "The only costs that will vary with reduced consumption are chemicals and some electricity, but that is a small portion of the total costs."

NEVERTHELESS, on an average day, Wichita consumes 42 million gallons of water with peak demands running as high as 84.25 million gallons. That is expected to increase to a 55 million gallon daily average, an 89 million gallon peak in 10 years and 65 million gallons a day and peaks of 130 million gallons in 20 years. Wichita will have to secure additional water supplies to cover those peak demands. The city is examining options for securing water at Kanopolis Reservoir, if that is enlarged, or from the proposed Corbin Reservoir on the Chikaskia River southwest of Wichita.

Another option would be to condemn other people's water rights in the Equus Beds. Wichita, Wynkoop said, didn't flinch about condemning land in three counties for Cheney reservoir or in the Equus Beds before.

He would prefer to see state law spell out who has priority rights to short water supplies — something that would give cities first priority before water users are at each others' throats.

"People are just beginning to see the tip of the iceberg where costs are concerned, especially with significant increases in waste treatment ahead," Wynkoop said.

ONE THING THE city is investigating, however, is the possibility that with increasingly more stringent environmental water pollution clean-up laws, the effluent from city waste treatment may approach a more useable state.

"We've asked our water plant consultants for this conservation study to give us estimates on how much more it would cost to add a little more disinfectant to the effluent to make it possible to run it back through the city," Wynkoop said.

McPherson city officials have taken the position

that it pays to conserve water now. Every consumer, notes Don Gerard, manager of the Board of Public Utilities, must up to finance new wells, plants and pipes.

The city was faced with a "drilled out" well field in the city limits over the Equus Beds. New wells had to be drilled about two miles west of the city and water piped back in.

"WE WEREN'T GREETED out there with open arms," recalls Gerard. "One of our wells pulls about four times as much as an irrigation well. They said if we moved out there we had to conserve and, besides that, a water appropriation can be reduced if you waste water. We have an obligation not to waste it."

McPherson water rates were raised 60 percent and the average customer had to pay about \$3.20 instead of about \$2.40 for the minimum amount of water. McPherson had to float a \$1.2 million bond to construct four new wells, a storage tower and new piping.

"But if we hadn't shaved the peak usage we had to cover, it would have required more wells and would have cost everybody more," Gerard said. "This community allowed us to stretch out the capital system. If conservation keeps up, this should cover us a minimum of 12 to 15 years, barring a lot of growth."

"Every town in Kansas has got to start looking seriously at the natural resource requirements against the jobs new industries may offer."

McPherson city officials sweat over whether they would find sites within well-spacing restriction for the four new wells. They bought land and with it the water rights from three different owners. They were turned down by one owner who wouldn't give up the water rights with the land.

"WITH THE CONSERVATION program, I could tell people here were really cutting back and it has saved them some money," Gerard said. "They no longer go home in the summer and pull my system down. We've never had the tremendous peaks in usage that we did before the program. People here got interested in the depth of the water table. No longer are they totally baptizing a lawn with water. They know it's foolish to think we live over an infinite supply of water."



# POLLUTION: Wastes Pose Threats to Supplies

By MARTHA MANGELSDORF  
Staff Writer

More than 1,000 disposal wells pump millions of barrels of oil recovery saltwater and a half billion gallons of hazardous industrial chemical junk beneath Kansas annually.

No one has taken a hard look at what the waste is doing below Kansas homes and farms or assessed whether it is creeping on a destructive binge toward fresh water supplies.

The national clean water and clean air acts attempt to wring every harmful pollutant out of the air and water, but, says Kansas Geological Survey Director Bill Hambleton, there's no place left to put the pollutants but back in land.

"It's got to move down into the groundwater system," Hambleton warns.

The brine from oil recovery activities (500 million barrels annually) and the hazardous chemical wastes injected as much as 4,000 feet into the tight, limestone Arbuckle rock formation, are only a fragment of the pollution sources that threaten ever dwindling fresh water supplies.

"SANITARY landfills are filled with a complex, dirty chemical system, and we don't know much about how those move or are transported below the surface," Hambleton says. "The same is true of septic systems and the sludges generated by municipal sewage treatment plants."

In Kansas, the most used methods of sludge disposal are land filling and land application. But heavy metals in sludge can seep into groundwater or can be taken up into the food chain.

"There is a real question what's happening below sanitary landfills and the only thing that's been done of much significance is to monitor some groundwater," says Gerald Stoltenberg, chief of water quality management for the Kansas Division of Environment. "We know that the stuff moves out to some extent below. Under 208, we'll probably start imposing tighter criteria for location of landfill sites and on how they're built — especially in sandy soil areas."

208 refers to the federal water pollution cleanup law that is ordering states to eliminate water pollution. 208 is the section of the law that funds state planning. The Kansas Department of Health and Environment figures water pollution abatement in Kansas will require an initial \$868 million investment — mostly federal dollars.

Already, the state requires feedlot operators to catch contaminated water running off feedlots. The department also sets regulations for disposing of the waste dredged off the lots.

But, admits Stoltenberg, testing to determine whether feedlot wastes are percolating into groundwater has been conducted at only two sites the last two years and much more work has to be done.

**FEEDLOT WASTES** can decompose rapidly into nitrates, and high nitrate concentrations in the water can be dangerous to infants and young livestock.

Fertilizers, pesticides and natural minerals — primarily sulfates and



chloride also threaten fresh water supplies.

The groundwater management districts require irrigation tailwater pits be dug to capture cropland runoff to recycle it or allow it to percolate back into the aquifers. But, especially in central Kansas where virtually all water that sits on the surface trickles back into the aquifers, the tailwater pits could carry fertilizers and pesticides into shallow domestic well supplies.

At the time tailwater pits became mandatory, the overriding concern was to prevent water waste. No extensive thought was given to potential pollution problems, says one groundwater district manager, but it is a legitimate question to raise.

Mel Gray, director of the state division of environment, says problems are beginning to crop up in Kansas with feedlot wastes and pesticides slowly sinking into groundwater. Lo-

calized areas of high nitrate concentrations have been detected, Gray says.

**POLLUTION OF** the aquifers is enough of a concern that Tom Bell, manager of the Equus Beds Groundwater Management District, says the district will begin a significant water quality testing program this summer. Bell said the district will collect a wide range of water samples and the state agency will analyze them, mostly for natural mineral pollutants such as calcium, manganese, sodium, chlorides and sulfates.

Bell says fertilizers and pesticides are not on the list because there is not enough money to pay the division to run all the tests needed and the agency has not volunteered to run additional tests for the district free.

To date, testing groundwater and soils around dumps and disposal sites have been sparse. No one really knows the effects of the messy chemical mixes or about the new chemical mixtures created as wastes degenerate. Little is documented on what degree they are leaching out and perhaps moving toward water supplies.

"We don't know, but we're concerned enough to want to do some more studies on oil field brines and industrial wastes that have been injected into the Arbuckle," Hambleton says. "We'll test drill into it to try to see how or whether it moves."

"The Arbuckle has openings in it — fractures," Hambleton adds. "We don't know much about the behavior of the system. Water will move, but not very fast. Our concern is in determining what it will take to move up into fresh water."

The Kansas Corporation Commission regulates the Arbuckle disposal wells, site selections and the depths disposers must drill to protect fresh waters.

"WHAT CAN foul up the game is a corroded well casing," Hambleton says.

The Kansas Geological Survey has proposed Arbuckle studies for two years, but Hambleton says the Kansas Board of Regents (its parent agency) or the Legislature has knocked the funds out of the budget. The survey has reprogrammed

money as it could to begin initial work.

The state environmental agency plans to expand injection control programs significantly the next year, says Gray. The department hopes to begin field inspections of all injection wells at least every five years and may require disposers to report fluid volumes and the pressure used to shoot it into the Arbuckle.

"With more and more demands on freshwater, even a little pollution is too much," says Gray. "One gallon of that brine can ruin 500 to 600 gallons of fresh water."

Nature also causes problems.

In east central Kansas, geologic formations contain salt and gypsum (calcium sulfate) and crop out on the surface.

High levels of salt can be hazardous to persons having cardiac or circulatory problems, say Kansas Water Resources Board studies. High levels of sulfates cause water hardness and may act as a laxative to people unaccustomed to drinking it. Neither chlorides nor sulfates can be removed economically by conventional methods, such as a water treatment plant.

**COMPOUNDING** the natural pollution problem, the state surveys indicate Kansas industries can produce about 22 million gallons of liquid and 126,000 tons of solid sludge hazardous wastes annually. The state has one licensed hazardous waste dump — in Furley — but the operator there says only a small portion of the dangerous substances believed generated in Kansas are being dumped there.

"There's no question in my mind that, perhaps not high volumes or one large dump, but a lot of small amounts of hazardous wastes are going into sewers or industrial backyard ditches," says Gray.

About four months ago, state environmental field inspectors began combing every industrial site in the state to determine the quantity and types of hazardous wastes being generated.

"We're cranking up the waste tracking system now and we may go to this session of the Legislature to get even a little more whallop to enforce disposal practices," says Gray. "Under existing law, we'll track it

from the point of generation, to transport, to the grave and after burial. Industries will have to show all the paperwork and transporters will have to sign off for moving it and disposal. In addition, we'll know where every container of waste is buried at the disposal site."

Should the Furley operators go out of business or the dump fill up and close, operators will still be responsible through bonds and insurance "until we say it's okay," Gray adds.

The Wichita-Sedgwick County Metropolitan Area Planning Department has been particularly concerned with septic tank leakage. In a recent water pollution survey, the department said that septic tanks are a major threat to water quality in Butler, Harvey and Sedgwick counties.

"**EXAMPLES OF** the failure of private septic systems abound in Butler County," the department said. "(High bacteria) counts have been discovered in the groundwater in certain areas around Andover."

The metropolitan department notes outbreaks of intestinal flu and hepatitis have been linked with waterborne viruses entering water supplies because of inadequate sewage treatment. Local planners were critical of the state department of environment because the agency does not require soil percolation tests to determine whether septic systems will allow pollutants to leach into groundwater.

"Further, in most instances, septic systems are inspected only once, upon installation," the metropolitan department says. "It is felt that the system should be inspected upon installation and reinspected at periodic intervals."

Stoltenberg says nothing in the federal water pollution control act specifically relates to groundwater protection.

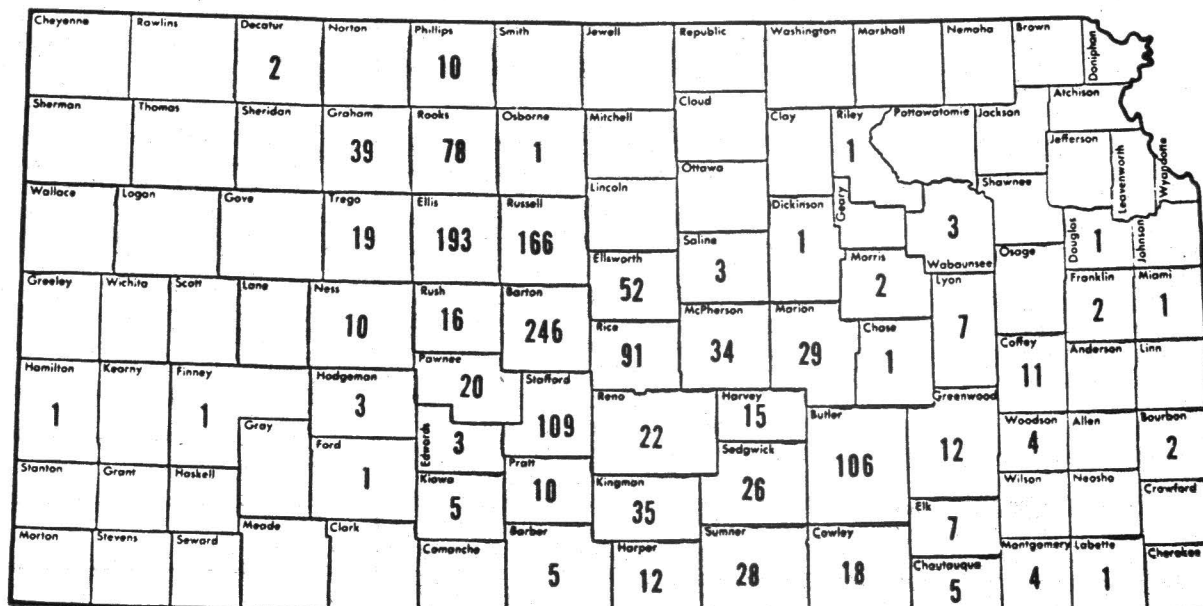
"But the next two years we're going to identify the major groundwater recharge areas and shallow groundwater supply areas," he says. "Perhaps we'll develop critical areas that must be protected from waste disposal, construction or whatever."

Gray says the state environmental department will ask the 1979 Legislature for authority to write rules and regulations to enhance groundwater protection when new developments are planned.

"**WE'RE GOING** to see that where homes are built on the city fringes or in rural areas, that sewage treatment is planned so it isn't running in ditches and into the groundwater," Gray says. "Many of the soils just can't take 200 to 300 lots to a subdivision with septic tanks. It would protect home buyers, too. A lot of them have moved in and six months later, they flush the toilet and look out in the backyard and sewage is bubbling up everywhere."

Under the state's 208 water pollution cleanup plan that will be sent to this Legislature for approval, cities and industries will have to upgrade or install expensive new waste treatment facilities.

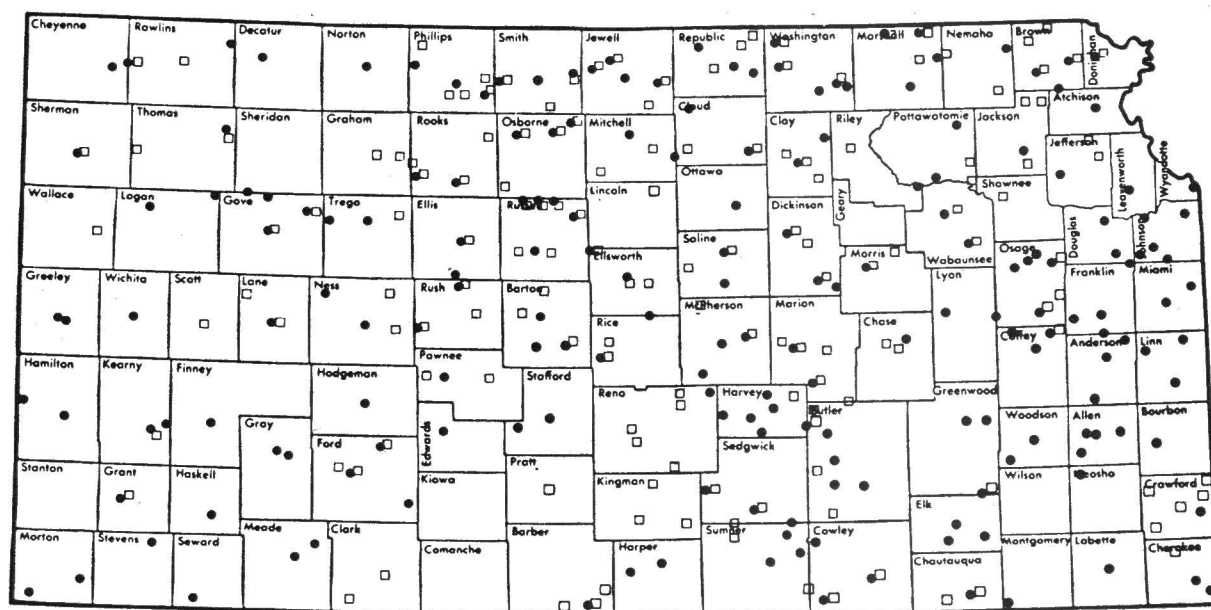
The state figures 14 municipal plants still providing only primary



Number of brine and hazardous waste disposal wells in Kansas

(See WASTES, Page 8, Col. 2)





● Quantity □ Quality

Areas of Kansas with water problems

Except Water

# Home Has Almost Everything

"It never occurred to us to ask about water when we bought what seemed like a very luxurious house with tennis courts and everything you could want," recalled Marilyn Crabtree, a Johnson County attorney.

The home she and her husband, also an attorney, purchased is between Stanley and Stillwell on the southernmost edge of the Overland Park suburbs that butt up to Kansas City. The house is on a five-acre tract in the middle of 80 undeveloped acres. A 30-foot well is sunk into limestone in about three feet of water.

"The owner sort of casually mentioned water after we signed the contract," Crabtree said. "Before we closed, we began checking with neighbors and the owner before. The neighbor across the road hauled water up until winter while he was drilling. He drilled six times before he found a little."

IRONICALLY, the suburban fringes and small resort lakes of eastern Kansas which seem to promise a hideaway from the hectic pace of cities present a painful dilemma to settlers like the Crabtrees — no water.

Finding a water supply in most of eastern Kansas where there is virtually no groundwater has been inordinately tough for people moving outside a city.

Lake Dabinawa was built just south of McLouth in Jefferson County near Lawrence, and weekend resort home lots were sold around it.

"There was a lake but no water for homes," said Howard O'Connor of the Kansas Geological Survey, shaking his head about the number of calls he receives every month from people who built or bought homes in eastern Kansas and never thought to ask about water.

"THEY'VE RESORTED to a number of things at Lake Dabinawa," O'Connor said. "They've built little mini-water plants and collect rainwater or lake drainage and filter it,

pump it and chlorinate it. Another guy, fortunate enough to build on the lake, dug a little ditch to the house and filled it with sand and uses that water some. Others haul all their water."

O'Connor said that if people in eastern Kansas buy a quarter section — 160 acres — there generally is some place to find water.

"It's people with one or two acres that have problems," O'Connor said. "We recently had a man call from Gardner who had just built a beautiful home and drillers told him there was no water. We checked and all we could tell him to do was build rainwater collectors on the roof and a cistern to store it."

That was all the survey could recommend for the Crabtrees, too.

"They told us it would be pointless to drill our well any deeper or to drill somewhere else," she said. "There just isn't any water. The nearest water line — a rural water district — is across the front road."

BUT THE CRABTREES are like others who move to an area after a rural water district is built. The districts are built for the people paying to hook on at the time and there usually is no additional capacity for newcomers. The Crabtrees were told that it would cost \$10,000 to \$12,000 to hook onto the district lines if the lines were never expanded.

"We'll build an underground cistern as a backup and catch rainwater off the roof so when the well pump stops it will switch to what's in the cistern,"

Crabtree said. "The pump will run about 35 minutes before it shuts off."

"What's really paradoxical is that we searched for a house like this for so long," she said. "We were looking for alternatives to consumptive suburban living. We were very conservation conscious." Crabtree said that ideally, they would live more economically by becoming self-sufficient for energy and water.

"We had great plans of this being perfect to entertain large church retreat groups and others," she said. "But when you're entertaining and the pump goes, how do you explain you can't flush the toilet anymore?"

The Crabtrees said they will install water savers in the toilets and flow restrictors in the showers and carefully schedule any washing.

"There will be real sacrifices," Crabtree said. "In periods of real drought, we'll have to haul water, too."

## Wastes Pose Threats To Water Supplies

★ From Page 7

waste treatment will be required to construct a second level of treatment.

"Upgrading 201 municipal treatment plants to comply with currently defined effluent (pollution) limitations will be necessary and nearly 60 industries will have to upgrade treatment," surveys show.

The problem for cities has been that most have allowed industries to dump wastes into city waste treatment systems. In many cases, when an industry dumps two or four times a month, the volume overloads city treatment systems and the pollutants run on by.

"Council Grove has had trouble in the past with a cheese plant and had to set up charges based on the strength of the dump, and they have had to limit the amount dumped," Gray says. "Arkansas City has had past problems with a meat packing plant

and had to limit the volume it sends into the system so it won't be overloaded."

BUT STATE officials say the instances of overload still occur regularly.

"Under 208, they're going to have to have on-site pretreatment at virtually every industry of significance in this state," Gray says. "With growth and complex chemicals around, we can't afford to lose up a resource that gets more scarce and vital all the time."

"Cities and industries are on strict timetables to plan and design clean-up," Gray adds. "Many of these cities are in line waiting for federal grants to fund the corrections. We don't feel we should be fining them while they're waiting for a federal grant for 75 percent of funding."

But if they fall off schedule, Gray promises the state agency will "jump right in the middle of their backs."

# Wichita Growth Threatens Area

★ From Page 5

water is with good information and that means knowing exactly what's being pumped," Bell says. "Irrigators now really have no idea what they're pumping."

TOO LITTLE water stunts crop yields and too much not only wastes the water but also can cause fertilizers and other soil treatment products to leach too far into the ground to help crops.

"Studies show you can raise 120 bushels of corn with 13 inches of water during the growing season — irrigation and rain and proper scheduling that pays close attention to the exact

amount of moisture in the soil," Bell said. "But a lot of irrigators have indicated they are using 20 to 22 inches of water, which is six to eight inches more than their appropriation right. A lot of guys here are still scheduling irrigation on the neighbor method — when one guy turns the water on the others all think they should, too."

Bell expects that meters will be required in the future if farmers won't voluntarily use them. The manager figures water use in his district could be cut roughly one-third with meters and water scheduling.

"I IMAGINE we'll see mass irrigation scheduling in this district if we can crank up our soil moisture monitoring and technical assistance program by 1980," Bell says.

Bell says most farmers are doing better jobs of conserving water, but the cities have a long way to go.

Wichita, says Bell, is using about 30,000 of the 40,000 acre feet it is allotted annually.

"Wichita could expand its draw another 10,000 acre feet under its right, but the city is looking for another 70,000 to 90,000 more acre feet and this district couldn't stand that," says Bell. If Wichita were to add wells it could displace enough water to make the saltwater move and then we'd all be losers in the end," Bell says. "If something happens to this supply, Wichita has other options. But the other people here do not. This district has suggested Wichita go elsewhere."

Besides the potential saltwater pollution, the Kansas Water Resources Board warns that the rechargeable central districts should carefully monitor possible pollution from livestock feedlots, fertilizers, pesticides and solid waste disposal sites.

"It is imperative the sand dunes and other recharge areas in the Equus Beds be protected," says James Power, board director.

The Kansas Department of Health and Environment is stepping up programs to guarantee groundwater recharge area protection.

## Series Reprint Available

"We're Running Out," the Wichita Eagle-Beacon's series on Kansas' water crisis, reprinted in tabloid form, is available. You can get a copy for 25 cents at the Eagle-Beacon building, 825 E. Douglas. Or you can order a copy through the mail. Use the accompanying coupon. Mail orders are 50 cents each. Bulk orders of 20 or more are 15 cents.

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# CITY WATER: Tradeoffs Coming in Future

By MARTHA MANGELSDORF  
Staff Writer

Nearly 800,000 Kansans will be affected by water shortages or water pollution problems in the next five to 10 years, a 1978 Kansas Water Resources Board Survey concludes.

But the numbers hardly do justice to the magnitude of the water supply crisis that is building in large and small, urban and rural communities.

"My gut feeling is that this water supply crisis is going to become very visible very fast, with cities trying to buy farmers' water rights or condemning water rights," said Dennis McCartney of the Kansas Department of Economic Development.

"From what I've seen and heard, everybody should be concerned about this," McCartney said. "Most officials haven't accepted this as a crisis yet. But we're going to have to make hard decisions on whether we're going to use water for food production or jobs and what the tradeoffs have to be. I hate to see priorities set on who can have water, but I don't see any alternative."

FEW COMMUNITIES will be immune from water supply problems in the next decade, water resource experts say.

Wichita is scrounging for more water, and officials in Colony, population 438, find water supply a perennial headache because they have no money to build an adequate system. At a posh southern Johnson County home, a couple limits the number of guests they entertain because too many people flushing toilets too often strains the water pump and it can shut off.

Leoti City Clerk Molly Fullerton says only two or three of the city's nine pumps are lifting water regularly. The city's only hope is that increasing costs of irrigation will drive some farmers back to dryland farming, allowing the city to buy their water rights.

The Kansas Water Resources Board survey turned up 56 Kansas cities that experienced water shortages in the 1976-1977 drought, and officials in 156 cities said supplies will fall short of demands during the next five to 10 years. Thirty-five cities expected the shortfalls to occur within the year. In 1977, 123 cities reported imposing voluntary or mandatory restrictions on water usage.

Sixty-one of the cities anticipating a water shortage also have water pollution problems — mostly from natural minerals. Ninety-four other cities have experienced water quality problems that may require a change in the supply source.

"THERE ARE probably more than a few people in Kansas who believe that, over the long run, the drought of 1976 and 1977 was too weak and too short — that a more critical and widespread crisis might have paid long-term benefits to Kansas," said Ernie Mosher, executive director of the Kansas League of Municipalities.

There are only five counties of the state's 105 that told the Water Resources Board that a water quality or quantity problem is not anticipated in the next 10 years — Comanche, Kiowa, Sheridan, Stanton and Wyandotte.



Three-fourths of the public water supply systems that anticipate problems during the next 10 years are in eastern Kansas. But the Water Resources Board says that more than 60 percent of the people who will be affected by shortages will be in western Kansas because two large cities — Hays and Liberal — expect supplies to fall short.

In eastern Kansas, the problem is one of virtually no groundwater, and streams and creeks that dry up in summer or freeze in the winter when autumn rains did not fall.

In western Kansas, water is running out and the well-spacing regulations and moratoriums on new well-drilling leave cities with no places to put down a new well. Their only options are to buy water rights from farmers or condemn and take a farmer's water.

"IT MAY COME to a real row between cities and towns and farmers, but I don't envision cities and towns exercising the right to condemn right away," said former southwest Kansas groundwater district manager David Pope.

Keith Lebbin, west central Kansas groundwater district manager, said, "I talked to one city attorney and he is reluctant to consider condemning water rights. These are all agricultural communities, and without agriculture, they've got nothing."

Added Pope, "Most cities still feel they should have superior rights over farmers, but there's no free ride — no exemptions."

At least one water resource expert said there are indications that cities are moving to approach the Kansas Legislature to establish a priority allocation system for the day water supplies no longer will cover water rights. Because of the first-in-time, first-in-right nature of the state's water rights law, should any reductions be necessary in water rights,

they would be cut off or reduced in inverse order of seniority. Many cities with junior rights would like to see an emergency allocation procedure established that would give cities first options on remaining water.

The problem, Lebbin said, is that until January 1978, drilling without filing for a water right was permissible. "Now everyone must have filed for a right to take your water," he said. "Many small towns all over the state were lax in filing for water rights before the new law. When cities drilled, they didn't file. Now they have a higher number in line and by law, no special preference."

IN EASTERN KANSAS, there are few groundwater rights to condemn. Groundwater is virtually nonexistent, making it touch-and-go to find enough to supply mushrooming populations.

The mundane nature of water coming out of the faucet belies the complex process involved in getting it there from its source, the Water Resources Board report said.

"Whether we like it or not, public decision making is often crisis oriented," said Mosher, of the League of Municipalities. "We are more comfortable in trying to solve problems than in trying to prevent problems. Mayors seldom get re-elected for helping to bring about an assured long-term public water supply, especially if a rate increase is required. The general public is primarily concerned as to whether the tap can be turned on today."

Said McCartney of the Department of Economic Development: "Today, local officials are elected on platforms to keep taxes down. Cities then end up with an inadequate supply. We've gotten severely behind."

THE RATE INCREASES have begun and they promise to follow Kansans well into the future. Statewide demands on public water supply systems are projected to increase from 117 billion gallons annually in 1975 to 134 billion gallons in 1985, and to 157 billion gallons by the turn of the century. That means developing an other 110 million gallons a day in 20 years, making immediate the need

for advanced planning, engineering and financing.

"For many small cities, the cost of planning studies and engineering designs would consume all available funds and leave none for construction," the Water Resources Board survey said.

The water board estimates that, during the next 10 years, communities with fewer than 5,000 residents will have to find on their own \$175 million to \$350 million to develop new water supplies and to pay for treatment, storage and distribution systems.

There are about 220 operating rural water districts in Kansas, and demands for Farmers Home Administration loans have been about double the amount of funds available.

There is a movement to form new rural water districts in western Kansas. But as the districts move west, they tend to increase in size with greater distance between users, making high development costs.

THE WATER RESOURCES Board estimates that initial building costs for a new water supply reservoir and main pipeline for a population of 250 will be \$340 a person, or \$110 a person for a well and main pipeline. In a community of 5,000, it would cost \$220 a person for a reservoir and main pipeline, and \$30 a person for a well and main pipeline.

The Farmers Home Administration estimates that the number of rural water districts in Kansas could grow to 400 and 500 in the near future, as small towns and rural users band together to ensure adequate water supplies. But they must secure a right to appropriate water before grants become available, and that is tough in large portions of western Kansas.

There are 74 applications pending with FmHA for \$18.4 million in water development loans, and 34 applications for grants totaling \$6.75 million.

Aside from communities forced into water conservation because supplies cannot be stretched to meet all demands, some communities' officials are beginning to take a harder look at conservation, and the federal govern-

ment is moving to make conservation the order of the day.

"WATER conservation will not cure all the problems and generally, it will not make more water available in a hydrologic region," the League of Municipalities' Mosher said. "But water conservation is of particular importance to municipal systems because a moderate reduction in demand or in peak demands can reduce treatment cost; delay or avoid capital costs for new storage, diversion or treatment facilities and, occasionally, obviate the need for costly transbasin transfers."

Last June, President Carter said that a new national emphasis on water conservation will be a basic objective of the emerging national water policy.

Carter has proposed that the Departments of Agriculture and Commerce, and the Environmental Protection Agency modify existing financial assistance for municipal water supply and sewer systems. Modifications would require community water conservation programs as a condition of contracts for storage or delivery of municipal and industrial water supplies from federal reservoirs.

In addition, Carter proposes that the Departments of Agriculture and Interior implement conservation programs to discourage groundwater depletion through agriculture assistance programs.

MOSHER SAID he firmly believes, however, that people in communities should determine their water supply futures and that state and federal controls should be exercised only when the objectives of higher levels of government would be jeopardized.

Mosher suggests that the state mandate a local water supply planning process in every community.

"This suggests that every local unit be given a public charge to examine its existing water sources, to anticipate future demands and to develop plans for adequate future supplies," Mosher said. "Included also might be a requirement for development of drought contingency plans."

## City Problems Different

By MARTHA MANGELSDORF  
Staff Writer

Throughout January, Garnett was supplying 70,000 to 80,000 gallons of water a week to smaller rural towns with no water — the bulk of it to Mound City, a town of about 825 that sits 10 miles from the Missouri border in east central Kansas.

"Our water supply is low, but not critical just yet," said Garnett City Manager Rick Doran, who watched North Lake, a small emergency water supply for the town 25 miles south of Ottawa, drop about 8 to 10 feet by January because autumn rains that fill it with runoff water didn't materialize. The town's main wells on Cedar Creek hadn't pumped for three months because there was no water.

"There's no groundwater to speak of around here and if you go to drilling, you run into saltwater if you find anything," Doran said. "Eastern Kansas has less water than most places."

The answer to eliminating the havoc dry spells create in the town is to build a wholesale water supply district to serve all of Anderson County, Doran said. Under recent

legislation, a district can issue bonds to finance a project.

FOR GARNETT, POPULATION 3,029, the price of a reliable water supply will be high — an estimated \$4 million to build a reservoir on Cedar Creek. Customers would pay a basic charge of about \$8 a month plus an additional charge for water used.

"What's difficult is that when there are good rains, in everybody's mind, there's no problem," said Doran. "It's awfully hard to get the thinking across that because of droughts, we need to plan for the future."

In mid-January, Colony City Clerk Arlene Rush said people had been forced to cut back water use and the town regularly published pleas to keep up the conservation effort.

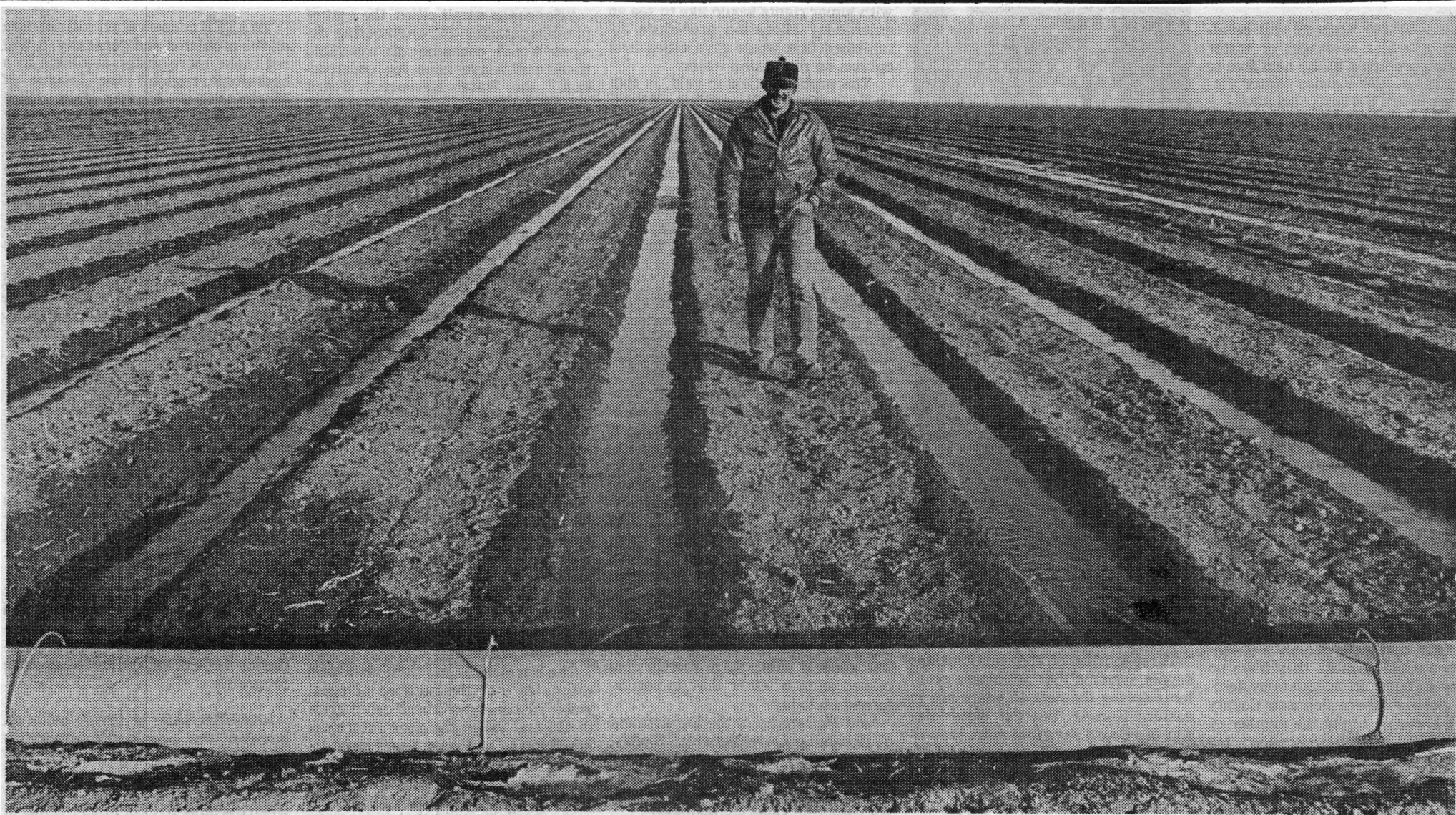
The southern Anderson County town of 438 residents uses about 35,000 gallons of water a day but the three wells on Deer Creek were pumping only about 10,000 gallons a day each in January. But those wells are a blessing. In January 1977, the town had less than two weeks' supply of water left in Deer Creek. Efforts to get water from Iola

(See PROBLEMS, Page 12, Col. 1)



# How Three Families Adjust

Staff Photos by Anthony Reed



*Greg Graff worries that the lower water table will change the future of his farm*

## Failing Wells, So Try 'Pre-Irrigation'

*"May the rains fall soft upon your fields and until we meet again may God hold you in the palm of his hand."*

— Prayer in Vic Graff's household

By KAREN FREIBERG  
Staff Writer

**MARIENTHAL** — Greg Graff stood bundled in a heavy coat watching the cold water burble from pipe and across the January field.

"Farmers out here are talking in terms of when the water runs out, not if," he said as ice began forming along the furrows. "Ten years ago that wouldn't have been so."

Greg and his brother, Gary, and father, Vic, think about water alot — even in the dead of winter. Together they farm about 3,200 acres just south of Marienthal in Wichita County.

**IRRIGATION DURING** the winter months is becoming more and more frequent in parts of western Kansas as less and less water is available.

Farmers here call it "pre-irrigation" —

the process of soaking the unplanted fields deep into the root-bearing strata, where the water is stored and used by plants during the growing season.

Pre-irrigation is necessary because some farmers, like the Graffs, are finding their wells aren't pumping enough water fast enough to meet a crop's demands during the growing season.

The fewer gallons a well pumps per minute, the longer it takes to cover a field with water.

**FOR INSTANCE**, if a well pumped 900 gallons a minute, it would take 24 days to put two acre feet on a 48-acre field. As the size of the field increases, to 100 acres, for instance, the time it takes to get it watered increases proportionately — in this case to 48 days.

The problem is that the Graffs' wells have dropped from 1,000 gallons a minute to less than 500. Under these circumstances, it is not uncommon to find some farmers running their pumps nonstop 10 months out of the year.

Pre-irrigation guarantees that all 700

acres the Graffs have under irrigation will get water.

"We have six wells altogether pumping from 50 to 500 gallons a minute," explained Greg. "With that kind of gallonage, we can't cover all our ground when it needs it in the spring, so we water now and it sinks down about four feet into the ground."

**FIVE YEARS** ago, he said, most of their wells pumped three times the amount of water they pump today.

In 1948, what they refer to as the "big well" on their land pumped 2,100 gallons a minute.

Today it pumps about 500.

According to Greg, the water table has been "dropping noticeably" in the last eight to 10 years. It's the beginning of a downhill ride.

The drop can mean the difference between getting enough water to a crop at the right time or losing it.

To increase the output, the Graffs have hooked several wells together.

They also have decreased the number of acres planted into irrigated row crops from

about 700 in 1973 to half that today, Greg said. The rest is sown to irrigated wheat, which requires about one-fourth as much water as corn.

**THEY DON'T** plant as much corn as they used to and are increasing the amount of irrigated grain sorghum they plant, which requires only about half the amount of water as corn, Gregg said.

"About 300 acres that we used to irrigate sets idle each year because there isn't enough water for it. Instead, it's summer fallowed and planted to dryland wheat.

"Changing from corn to milo means a drop of income," he asserted, by as much as \$150 gross an acre.

For the Graffs, who live on the shore of an underground lake that's going dry, the future lies in dryland.

"People are afraid of buying irrigated land," he said. "Dryland is demanding more of a premium. It's been proven in what it produces."

He says irrigated land in his area still sells higher than dryland, but it's not increasing in value.



# 'Aftereffects of Tidal Wave'

"It was a lot different then. We never had any idea the water would run out." — Bill Linin  
 "It's a crisis . . . by the time they get the water table stabilized, it's going to be too late."  
 — Brent Linin

By KAREN FREIBERG  
 Staff Writer

**GOODLAND** — In 1956, irrigation hit Bill Linin's farm like an underground tidal wave. It is no exaggeration that his son, Brent, is just now suffering the aftereffect.

At age 68, Bill Linin recalls his journey 20 years ago to west central Kansas to get an education in irrigation. "I had heard a lot about it and wanted to know more," says Linin.

**SO HE LEARNED** from veteran irrigators what he needed to know and carried the knowledge back to his Goodland farm.

In 1956, he filed one of the first water rights in his area. His first well came in at 720 gallons a minute, he remembers, and with that he thought his future was secure.

In 1979, however, the future for Brent Linin, 31, may be as unstable as the water table.

"It's definitely going down too fast," says Brent of the amount of water under his land.

"**THE WATER TABLE** must be lower than it was," adds Bill. "The wells aren't pumping like

they used to and everyone is complaining about it. That's a pretty good indication the water table is dropping."

The well that pumped 720 gallons a minute in 1956 now works hard at pumping 400.

The 300 acres of corn and alfalfa once irrigated by that and another well have been reduced by a third or more.

Those acres that used to produce corn every year under irrigation now yield a crop of dryland wheat only once every two years, joining the



Bill Linin

Linins' other 1,700 acres, which are on a wheat and summer fallow rotation.

**SOME IRRIGATED** land near his farm, once valued at \$1,000 an acre, recently sold for half that, says Brent.

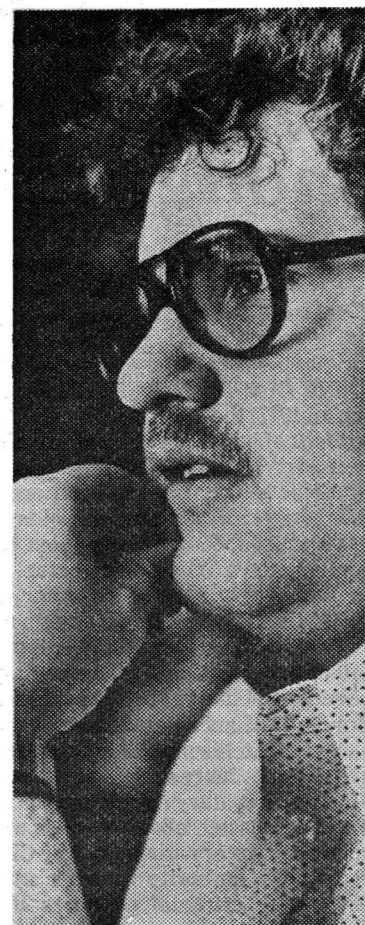
Economics and the difficulty of getting a new drilling right all but kill any prospect Brent might have of sinking a new well elsewhere.

"It's harder to get a right because the water table is going down," says Brent. "If we did drill a new well, it probably wouldn't be worth it. You'd be looking at another 400 gallons, probably, at a cost of \$20,000. You couldn't pay for it the way prices are now."

But there's still another reason Brent isn't investing in irrigation. He's facing what "guys with 10 or 15 wells can't afford to face" — the limited water supply must be conserved.

**THAT'S ONE REASON** he has decided to run for a seat on the board of the local groundwater management district. "I'd be in favor of stopping the drilling of new wells. We have to start cutting it down until the water table stabilizes and stops dropping," he says.

"You're going to have to put regulations on it to just hold it where it's at. Whatever it takes. It will make a lot of people mad, especially those who have a lot of money invested in wells and a lot borrowed. It would really hurt them financially if that was initiated."



Brent Linin

## Dust Bowl Days Haunt Kansas Farm

"If they put more teeth in the groundwater management districts, it would cause the worst range war you've ever seen." — Leon Scheuerman

"If they told me to shut off my well I'd tell them to go to hell." — Roger Scheuerman

By KAREN FREIBERG  
 Staff Writer

**DEERFIELD** — The Scheuerman family roots rest in the irrigation cradle of western Kansas.

For more than half a century, the land and the water under it nurtured three generations of Scheuermans. They have never known their land without water.

Until now.

In 1934, "when there was still water in the Arkansas River and apple orchards on its banks," Leon Scheuerman, 58, remembers his father drilling the farm's first deep well — 180 feet.

**IT WAS HIS** father's bid to raise feed for his cattle during the Dust Bowl days that sparked that first irrigation well in the area.

Two years ago, Scheuerman's son, Roger, 31, drilled what will probably be the last irrigation well to be drilled on their land.

He recalls the family's battle for the right: "We had a heck of a fight to get the water right, and then, after drilling 28 test holes,

we found the best water was too close to an existing well to meet the spacing requirements."

At one time or another, up to 60 test holes have been drilled in that piece of land, he says.

In Groundwater Management District No. 3, where the Scheuermans' land is located, new drilling rights are being denied where the combined withdrawal of all the wells in the nine-square-section area would deplete the aquifer by more than 40 percent in the next 25 years.

**WHERE NEW** irrigation wells can meet these restrictions, the wells must be at least 1,300 feet apart, and any well pumping more than 400 gallons a minute must be 2,300 feet from any other well.

Such restrictions were mandated by groundwater management officials to halt what they contend is an alarming drop in water tables in this area. Many farmers who still have productive wells question the strictness of the regulations.

Scheuerman's new well came in at 600 gallons a minute, which meant there had to be at least 2,300 feet between it and another irrigation well on the same property.

"The problem was that the best place for this well was too close to the other well," Roger said.

On another part of their more than 3,200 acres, Roger claims that the drilling moratorium has



Roger Scheuerman (left) with father, Leon

caused the value of "good irrigated land" to slide drastically.

"The Federal Land Bank quoted us a value of about \$170 an acre for some irrigated ground Dad owns in the sandhills," Roger asserted. "This land has eight wells pumping 1,200 gallons each. The same land would sell for \$750 an acre outside the moratorium area."

**NOT SURPRISINGLY**, the drilling restrictions and well-spacing regulations have these farmers upset.

"Water is the most precious thing we have . . . more than

gas . . . more than oil," admits Roger. "But to limit the gallons a farmer can pump or shut down the wells would bankrupt this whole area."

Because there are no water laws pertaining to water that might exist in aquifers below the Ogallala, like the Dakota and Cheyenne, the Scheuermans at one time considered drilling into them.

"We didn't actually do any test drilling that far down," Roger said. "But we did check out gas and oil well logs that would show where the water was."

What they learned was not

promising. Any water pockets beneath the Ogallala on their land would have been too expensive to pump. "It would have cost \$180,000 to drill and set the pump. To lift the water would have been prohibitive," Leon said.

In keeping with their belief that "farmers should police themselves," the Scheuermans have switched completely to irrigated grain sorghum rather than corn to conserve water.

"We give milo about three irrigations a year. It would take seven to eight irrigations for the same amount of corn," Roger said.



# Problems Are Different Among Cities

★ From Page 9

failed because it had contracts to supply a rural water district.

**COLONY COULDN'T AFFORD** to hook onto the water district. In 1977, the town raised rates by \$1.50 on the first 1,000 gallons of water used. The town also drilled the wells to tide it over in future shortages.

Even those efforts haven't been enough. With the rate increase, the price of water in Colony rose to \$5 for the first 1,000 gallons, compared to about 88 cents for the first 1,000 gallons for a Wichita customer.

"We desperately need more water, but we don't have any options until we settle up on our new sewers," Rush said. "That cost us \$200,000 and that was with the Environmental Protection Agency paying 75 percent of the costs. We've just had to postpone looking for more water."

In July 1977, Lancaster, in northeast Kansas about 10 miles west of Atchison, had only 17,000 gallons of water, enough to last its 300 residents about two days. At Hays, in Ellis County, voluntary restrictions on water use went into effect and, at Russell, about 70 miles west of Salina, there was voluntary water rationing. The City Council gave the mayor standby authority to order mandatory rationing and to impose criminal penalties if voluntary efforts failed.

**THAT SAME YEAR** in eastern Kansas, Princeton's wells pumped mud and leaves, and the nearby towns of Reading, Baldwin, Edgerton, Lane and Scranton looked for places from which they could haul water.

Laren Dinkel, water quality control engineer at Hays, said the city has relocated three wells that were pumping sand and installed a new booster line to get water to the city plant. But the city still will need another well, and test-drilling indicates that the nearest water is about 10 miles away and will have to be piped if it is developed.

In western Kansas, there is still groundwater for towns to tap, but they are thwarted increasingly by well spacing and withdrawal restrictions of the groundwater management districts. In southwest Kansas, for example, any new well that pumps more than 400 gallons a minute must be 2,300 feet from any other well.

Liberal City Manager Alan Morris said the town anticipates problems in ensuring future water supplies and has been negotiating for a "sizeable portion of land" about 14 miles from the city, near the Cimarron River, where a well can be fit into spacing guidelines.

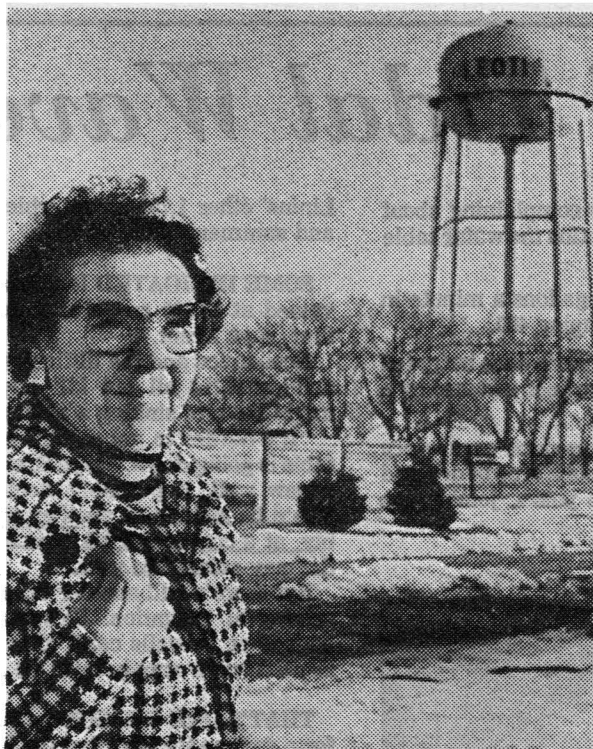
**AT LEOTI, IN WICHITA** County in west central Kansas, City Clerk Molly Fullerton says six of the city's wells aren't pumping because the groundwater level has dropped considerably.

"Two or three still operate," she said. "But it's pretty bad. If we go north about 8 to 12 miles and build a pipeline, we could probably get water, but funds would have to be available. We have hopes that some farmers around here will decide to go back to dry land and sell their water rights. We're looking forward to that, but whether it will materialize, I don't know. The costs will still be awfully high, but we don't want to condemn unless we have to and there's no other way."

Goodland, population about 6,000, has one offer to buy a parcel of land that has a 2,000 gallon a minute well already in place. The city needs more water and its options may be severely reduced if a moratorium on new well-drilling goes into effect in the area this summer. Its older wells have dropped off 20 to 50 feet in the last 10 years, said City Administrator Jack Heuback.

"I just really don't know what water rights are going to sell for," said Heuback, adding that dollar negotiations have not gotten underway on the 2,000 gallon well. "A farmer's got a commodity there, and there's a demand for it. It's not going to go cheap. But we'll fight blood and tooth for it."

**"IF PUSH COMES TO shove** and it's a matter of having water or not, Goodland wouldn't be opposed to condemnation proceedings to serve the majority of the people. But the problem is becoming costs, especially in a town with a small customer base, it's much more costly.



Molly Fullerton

"For Goodland, this is a relatively new problem that suddenly hit us in the face," Heuback said. "We also have the option of buying land for water rights and we've explored the option of buying it, then leasing it back for dryland farming. But we hate to get into the real estate business."

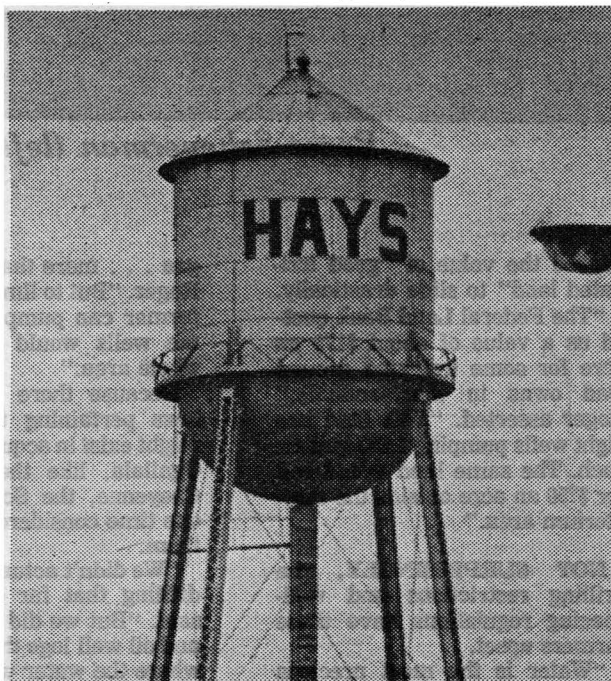
Goodland, in Sherman County in northwest Kansas, recently was considered by Monfort, Inc., a Colorado-based beef packing industry that was looking for a new plant site in Kansas. Heuback said the industry would have had to find a large-capacity well, and the city would have had to find another one also.

"Goodland is almost totally agriculture oriented," Heuback said. "We'd like to diversify, but people are holding off a little now on expansion."

**WEST CENTRAL KANSAS** Groundwater District Manager Keith Lebbin said most towns in the area have water problems. Scott City, which is in a trough, and Dighton may have supply shortfalls, he said. Tribune had to take its wells several miles north of the city and pipe back as did Sharon Springs, which pipes four miles from inside the district to the city outside the district.

"A number of cities are talking about trying to buy irrigators' rights out here," Lebbin said.

"In the southwest district, in general, we weren't exempting cities from the 40 percent depletion in 25 years restriction," former manager David Pope said. "But we felt we had to waive well spacing in Gray County for Ingalls, whose capacity wasn't enough, and for Ulysses and others because they would have had to go out so far and pipe the water, they just couldn't afford it."



Hays has relocated 3 wells

# Drillers Already Feeling Pinch

By MARTHA MANGELSDORF  
Staff Writer

"Our business is running 40 to 50 percent down in new hole drilling," says Bob Minter of Minter-Wilson Drilling Co. at Garden City.

"The greater proportion of our work is in repair and replacement," echoes another well driller, Andy Erhart of Henkle Drilling and Supply Co. at Garden City.

Joe Beebe of Casterline Irrigation at Dodge City, a center pivot irrigation equipment supply company, says his sales began dropping off 18 months ago. The slowdown was compounded by a southwest Kansas management district's moratorium that prohibited any new well that would reduce the groundwater supply more than 40 percent in 25 years.

"As the water's depleted more and more as time goes on, business will slow to a snail's pace," Beebe says.

**HIS COMPANY** alone has worked with 15 farmers since July to plan new irrigation systems, only to be thwarted when they applied for a water right. Beebe said he knows of as many others that made water applications and were turned down.

"We've already begun diversifying into grain storage bins — construction of metal storage buildings for on-farm storage — for down the road when maybe the water supplies are cut off," Beebe said. "But the multiplier effects of this will still be felt because most of the diversification still has to be to other agriculture-related endeavors."

A major agriculture land loan company that was averaging 33 years time to pay loan debts has shortened up to 20 years and 10 or 15 in some cases, says one west central Kansas loan official.

"Loan companies are, generally speaking, restricting loans now to 15 to 20 years," said Don Hansen of Western Land and Loan Co. of Scott City. "They just don't want to be caught on outstanding loans. They've reduced the time to see the investment sooner."

**HANSEN SAID** in better times, it wasn't uncommon to borrow enough to finance a complete irrigation project and still squeeze a year's operating costs out of the loan.

"Loan maximums around here are now running about \$650 an acre and a sprinkler investment is about \$1,000-\$1,200 per acre," he said.

With loan companies hedging on investments where water and energy costs may not support the margin of profit to service debts, Hansen says outside investors are providing the capital to make up loan shortfalls.

"The only ones that can afford irrigation now are the supers and the little guys are getting squeezed out," Hansen said. "Out at the Colorado state line and north of here, foreign investors are buying a lot of big blocks. It's mainly Canadian and German money, but the Arabs have been nibbling."

loan official, also is keeping bad irrigation operators in business and those operators too small to make it on dwindling water, high energy prices and low crop sales prices. He points to Farmers Home Administration and Small Business Administration funds.

At the First National Bank of Goodland, Vice President Bill Gray says a lot of farmers have a half million dollars invested in land and irrigation equipment.

"Most of them are carrying a pretty good debt load now," Gray said. "It gets to be a real problem. It gets so cash flow won't service the debt they're carrying. These guys can't stand to borrow any more."

Gray says energy costs which have risen from about \$14.30 per acre in 1974 to about \$32.75 per acre last year are forcing farmers to turn toward more dry beans and milo and less corn in the northwest.

**"THE WATER** and energy could have a severe impact on Goodland if 50 families associated with Great Western Sugar are forced to relocate the irrigated beets," Gray said. "It would hurt a lot of agriculture related business."

Says Ray Purdy at the Garden National Bank, "Any lending institution is looking a lot harder at the individual borrower. Lenders want to know whether he can make a predictable enough return to pay off the loan. The water is going to figure into whether he converts to milo. But he may have so much mortgaged he has got to stay with corn."

"I feel there has to be a way to work this out," Purdy says. "I'm not looking to go bankrupt."

Adds Earl Fort Sr., vice president of the Grant County State Bank at Ulysses, "It's true, creditors in general are much more aware of water potential in placing values on business."

Another banker said if land with irrigation potential can not be developed or if water is not going to last under existing irrigated land and values are dropping, the land must be officially appraised at dryland values or survivors will take a severe bite on estate taxes when the property changes hands.



Andy Erhart

THE GOVERNMENT, says one



# ECONOMICS: *Thirsty Corn Sapping Water Supplies*

By MARTHA MANGELSDORF  
Staff Writer

The 1880s drought in Kansas was devastating, and by 1892, half the population of western Kansas had moved out — the conestogas proclaiming "In God we trusted, in Kansas we busted."

Between 1889 and 1893, 11,000 farm mortgages had been foreclosed in four years in the state. Around 1900, the farmers who chose annually to battle the elements to raise a crop in western Kansas began using windmills to pump groundwater from small wells. By 1920, 47,000 acres were under irrigation.

Then, on the heels of the Great Depression, came another drought with winds that whipped dry Kansas soils into huge, blinding clouds to form the Dust Bowl of the 1930s. Banks were failing and farmers were going out of business again. By 1940, 100,000 acres were irrigated in western Kansas, to hedge against such disasters.

Today, nearly 20,000 irrigation wells across Kansas pump during scorching summers to irrigate nearly 3 million acres of crops.

**FARMERS AREN'T** going bust yet, but the move back to dryland farming is under way. As the water runs out, the ramifications of major declines in Kansas' irrigated industry will be staggering.

When sales and income tax contributions to the state's general operating fund nosedive, the belt-tightening will pinch across the prairie. Just to replace the more than \$45 million in state sales and income taxes directly



attributed to the additional yields of irrigated farming in western Kansas would require a statewide half cent sales tax increase.

Kansas' financial vitality is tied to its agribusiness and as water pumps

are silenced, the fertilizer and pesticide and implement dealers see business plunge. Families pack up and move on.

Farmers who sought a niche for feedlots on the high Kansas plains in the heart of the western irrigated corn belt will have to decide whether to rely only on wheat and milo, import corn or move elsewhere. Cities that cannot diversify fast enough may founder. Already, the towns scrape the shale bottoms of the Ogallala aquifer in western Kansas just to find enough water to supply current needs.

If the population adjusts, so do seats in the Legislature, and the rural representation is eroded further.

Local officials in Western Kansas are quick to say the signs of economic decline are not all tied to dwindling water, but the water supply is a key factor.

**"WHAT HAPPENS** in Finney County affects the whole state," said Roy Bogle, Kansas State University agriculture economist. "Besides the tax revenues to support public needs that someone else will have to pay, it means, for example, decreased activity and economic gains at the eastern Kansas warehouse that supplies the ALCO store at Garden City. If half the personal income out there can be attributed to irrigation (as KSU economists' studies show) that means fewer western Kansas farmers are going to shop in Wichita."

Added DeLynn Hay, KSU agriculture extension irrigation engineer, "I believe agriculture is the largest purchaser of tires and trucks from De-

troit, and an economic decline in western Kansas will affect the tire production plant at Topeka.

"It will mean a real slowdown in the economic activity agribusiness generates in Kansas City and Wichita — the railroads, the grain elevators," Hay said.

Irrigation-related businesses "are beginning to suffer from this already," said one farmer from Scott City, about 60 miles from the west central Kansas border. "We used to have two irrigation supply companies here in town and both prospered. Now we have one company and it's doing practically all maintenance, and it's drilling practically no wells in this country."

**EVEN THE POPCORN** processors at Copeland, Ulysses and Marienthal in southwest and west central Kansas say their operations depend upon water being available to irrigate the 25 million pounds of popcorn produced annually in Kansas. Some contract growers are abandoning the commodity because water supplies are too short.

Hay said in the year ending June 30, 1978, 875 irrigation wells were drilled in Kansas, compared to 1,875 the year before.

"There used to be two irrigation pipe firms, now there's one," said the Scott City farmer. "Just this year in our town, school enrollment dropped by over 100 people. A declining water table is going to add to that out-migration."

**IN TEXAS**, where the dewatering of the Ogallala has far outpaced the water depletion in Kansas, agriculture economists have documented economic declines. The money invested in growing irrigated corn turns around seven times in the community before it leaves, from seed, to fertilizer, to insecticides and harvest.

To cushion the return to dryland farming, Kansas farmers are growing less corn and turning to milo or wheat which require about half as much water or less.

But the economists say the money invested in irrigated milo turns over only about four or five times, and wheat two or three times. That means if a farm grosses \$100,000 growing corn, it ripples \$700,000 through the community. With a lower gross from milo or wheat and a lower turnover rate, a community might see only about \$300,000 turn over if the same acreage is dedicated to those crops.

"That's the real effect it will have out here," said one west central Kansas farmer who has looked at the Texas assessments.

Two years ago, noted Bogle, Garden City was the second fastest growing community in the state.

"When I went out to Garden in '73, there were 18,000 people and 13 homes on the market," Bogle said. "A friend just recently left Garden and he said there are probably 150 homes on the market today."

**UNTIL RECENTLY**, a lot of people were locating in Garden City, said Dave Pope. In October, Pope left Garden City, where he was manager of Groundwater Management District No. 3, to become assistant to the chief engineer of the Kansas Division of

Water Resources.

"But they're not coming in like that now," Pope said. "There has been a slowdown in the general economic condition. You won't see 500 new irrigation wells go down in the vicinity of Garden annually. You'll never see that drilling boom again. You notice it at Garden and Liberal and Ulysses. Chamber of Commerce and city officials are all taking a new interest in water supplies and they're trying to diversify more."

Land values are dropping where moratoriums have closed an area to drilling. Some bankers and loan companies read the moratoriums as declarations the water supply is too short to guarantee much of a future for land already under irrigation and that dry land, which once had irrigation potential and sold for an irrigated land price, will now never be irrigated. It is being valued at dryland prices, which have been running less than half the price of irrigated land or potential ir- rightable and. In sandy areas that will not support a crop without water, the prices plunge from as much as \$1,500 an acre to about \$170 an acre — the price of scrub grazing land.

South of Scott City, good irrigated land with good water rights intact will bring \$1,300 to \$1,500 an acre, while land with mediocre water in Lane County had been bringing about \$800 an acre, said Keith Lebbin, manager of the west central Kansas Groundwater Management District No. 1. In Haskell County in 1977, a quarter section of irrigated land with a tailwater pit sold for \$1,200, while a dryland quarter brought only \$514 per acre.

**"PEOPLE ARE** more selective in what they're buying, and I don't think they're paying on the fringe areas the prices they were paying five and 10 years ago," said Pope.

Added Lebbin, "I've had several loan companies stop by the office and indicate they were not going to loan unless they're assured irrigation will last the next 10 to 12 years. They come in and check the depletion, the longevity of the aquifer."

One agricultural economist said he had talked to Ulysses bankers who are pessimistic that with water declines and energy costs, some borrowers are not breaking even on investments.

"The loan companies just are not going to loan unless a guy can get water," Lebbin said. "You see a slowdown and a decline in small towns here now, with the slowdown in agribusiness. When irrigation goes out, the towns will, too, unless they diversify."

Dave Darling, resource economist with the Kansas Water Resources Board, said preliminary calculations indicate each acre foot of water applied generates about \$120 more for the farmer per acre than he would realize with a dryland crop. In Kansas, farmers apply an average of 1.7 acre feet of water per acre each year and thus earn an average of \$200 more per acre than they would with dryland farming, Darling said.

**WITH AVERAGE** prices of \$3.35 a bushel for wheat, \$2.27 a bushel for grain sorghum and \$2.55 a bushel for corn in 1975, Darling figured west central Management District No. 1

(See FARMERS, Page 14, Col. 1)

## Glamor Going Out Of Growing Corn

By MARTHA MANGELSDORF  
And KAREN FREIBERG  
Staff Writers

Exotic. Glamorous.

The words sound strange when they roll off the tongues of western Kansas farmers, especially when they are adjectives for a common enough crop — corn.

Corn is fast becoming a controversy in western Kansas. For many years the yellow kernels were the driving force behind the economy.

Today, farmers and groundwater management officials are taking a hard look at the dark green stalks that are sucking dry a large portion of the state.

Like a promising love affair gone sour, corn is changing from catalyst to culprit, leaving in its dust the farmers who invested millions of dollars in its future.

Why the turnaround?

**IN A WORD**, it's "water" — or the lack of it.

Among the most water-intensive crops grown in western Kansas, corn requires a minimum of two acre-feet of water in addition to the normal rainfall.

"In my opinion, corn is the worst thing that happened to western

Kansas from the standpoint of what it's done to the water," said Keith Lebbin, manager of the groundwater management district in west central Kansas.

So why does corn remain the glamor crop of western Kansas?

From the standpoint of boosting the economic growth of the area, corn has been a blessing.

It was the area's potential for growing enormous amounts of corn that was a major attraction for feedlots during the 1960s. Today, western Kansas ranks high in the nation as a producer of fat cattle.

**IT ALSO RANKS** high in corn consumption.

Farmers met the demand by sinking an ever increasing number of irrigation wells, breaking out more and more prairie to accommodate corn.

By the early 1970s, western Kansas' production easily outdistanced that of eastern Kansas, the state's corn capital before irrigation.

Packing companies followed the feedlots. With them came new employment opportunities and new capital to the sparsely populated counties of western Kansas.

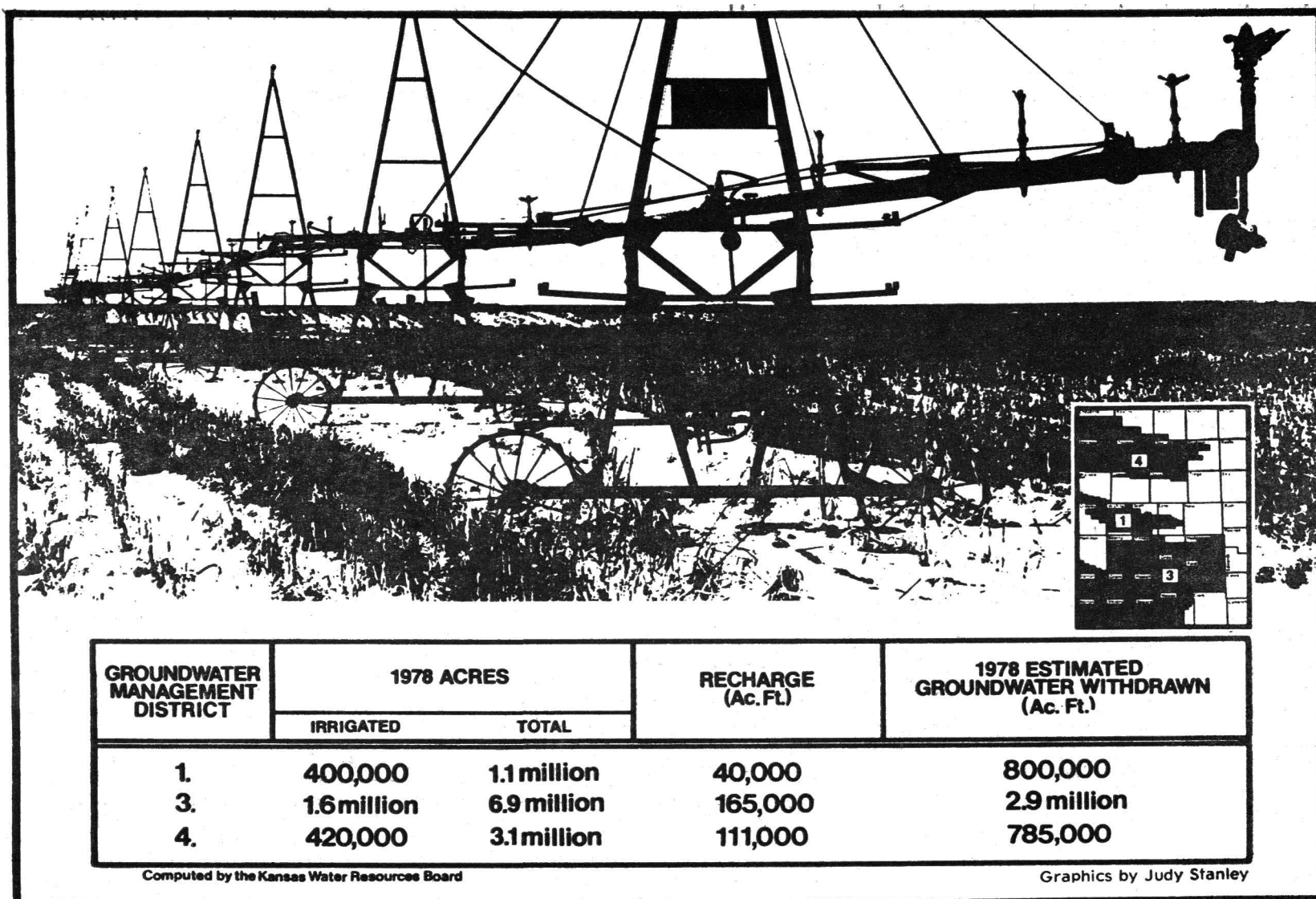
But as a cornerstone of that econ-

(See GLAMOR, Page 18, Col. 1)



WALLACE ROBINSON  
... Forced to drop corn





# Farmers Turn to Dryland, Revenue Loss

## ★ From Page 13

farmers enjoyed about \$70.1 million in earnings from irrigated crops above what they would have earned if they had planted the same land to a dryland crop. Irrigation in southwest District No. 3 brought farmers about \$276 million above what they would have earned with the same dryland crops, and in northwest District No. 4, farmers realized about \$90.8 million more as a direct result of irrigation. That's income and income tax and sales tax that would be lost with a return to dryland farming.

With 1979 prices in mid-January, farmers are earning about \$2.96 a bushel for wheat, \$2.25 a bushel for corn and about \$1.87 a bushel for grain sorghum in Kansas.

"A lot of people are questioning irrigation development in some areas," Pope said. "There are fears that the water will be gone before they amortize costs. They are starting to be exposed to longterm fears."

With energy costs rising and crop prices depressed, the loan companies and the farmers are taking a hard look at the debts that have to be serviced, and whether they can continue to irrigate. Some farmers would like to reduce water usage to extend water supplies for another decade of at least supplemental irrigation. Others are addicted — too hooked to quit.

"In reality, you can't get them to quit without strict enforcement and controls to monitor water use because they're too hooked on irrigation and want to maintain it to pay off investments," said one state water resource official. "Also, if a farmer can still

realize a return on an investment, he wants to get in or stay in instead of letting the other guy enjoy the profits as long as it lasts."

**IN AREAS WHERE** 1,000 gallon per minute wells are down to 400 or 500 gallons, it has got to become uneconomical to pump, said Pope. Most center pivot systems, said Bogle, require 650 to 1,000 gallons per minute to keep up enough pressure to make the optimum number of circles to water. Where the water table drops and the wells drop off, the wells must be drilled deeper or pump longer to cover the acreage. In some cases, the water is being stretched far beyond the optimum acreage for the system.

Drilling deeper requires more energy to lift water higher.

"There are a lot of irrigators closer to uneconomical pumping now than what we allow," said Pope. "In Grant, Stanton and some in Morton County as they've dewatered the Ogallala 100 to 160 feet since 1940, they've drilled into the Dakota and a few into the Cheyenne — 600, 700 maybe 800 feet."

**ONE WICHITA COUNTY** well plunges 960 feet to the Dakota.

But the Kansas Geological Survey notes that one Dakota well that's 450 feet deep in Ness County takes 54 gallons of liquefied petroleum gas to pump an acre foot of water, compared to an average 34 gallons to pump an acre foot of water from about 100 feet in Ness County River Valleys. In the central Kansas Equus Beds Groundwater Management District, water is

only 125 to 150 feet below the surface. Lift costs alone will not deter irrigation expansion and increased water demands.

The investment in irrigation systems can range from about \$25,000 to \$60,000 per quarter section depending on whether it is flood or sprinkler.

Bogle has done some rough average calculations on irrigation costs farmers should figure closely. For example, dryland grain sorghum would yield about 100 bushels an acre under full irrigation. What a farmer has to pencil out is what his optimum yield should be, given his costs, not necessarily his maximum yield, said Bogle. At about \$2 a bushel for grain sorghum, the gross income is \$80 per acre dryland, \$170 per acre under limited irrigation and \$200 per acre full irrigation.

But fuel costs can range from about \$5.50 per acre dryland to \$12.60 and \$19.60 per acre for limited flood and sprinkler irrigation, and \$16.40 to \$26.90 for flood or sprinkler full irrigation, Bogle figured. Fertilizer costs will range from about \$6 per acre to \$27 per acre, Bogle said. Herbicides and insecticides will range from \$11 to about \$17.25, and seed costs will range from about \$2 per acre to \$4 per acre.

"IT'S A MATTER of economics for the individual farmer in the short run whether he'll conserve water," said Bogle. "But, for example, wheat requires maybe one foot of water compared to alfalfa that requires three feet. However, you stand to make more than three times as much on alfalfa. You seem to make the most on

the most water intensive crops."

Bogle said water supplies will dictate farmers' decisions to abandon corn sooner than energy costs.

The difference in fuel costs between watering sorghum and corn could mean roughly about a \$5 savings per acre, Bogle said. But the farmer could lose as much as \$30 in profits per acre switching from corn to sorghum, which uses about half as much water.

"He's saved \$5 in fuel costs, but lost \$30," Bogle said. "From the individual farmer's point of view, he will probably argue it's in his best interest to make the maximum profit today. But from the greater community viewpoint, it's probably better to extend the supply of water as long as you can."

**IN THE LAST FEW** growing sea-

sons, more than one million acres of irrigated corn have been harvested in Kansas, yielding more than 140 million bushels — the bulk of it in western Kansas. Without irrigation there is not enough rainfall in western Kansas to grow corn economically. About 570,000 acres of dryland corn elsewhere in Kansas yield only about 30 million bushels.

Federal crop subsidy programs may affect farmers' decisions on how much corn to plant, but many farmers say water is the major factor in more and more decisions to reduce corn acreage.

In northwest Kansas, the acres of corn planted dropped from 253,600 in 1976 to 250,900 in 1977. In west central Kansas, the decline was from 224,400 to 211,600 and in the southwest, acres planted dropped from 704,000 to 695,500.



Culprit in water shortage?



# FUTURE: *Many Choices, but No Solutions Over Water*

By **MARTHA MANGELSDORF**  
And **KAREN FREIBERG**  
Staff Writers

Historians record the plight of one Kansas settler who, when asked why he daily carried water from a neighbor's well instead of digging to find his own water, replied that he'd just as soon go a mile in one direction for water as another.

There was a time when Kansans thought water would last forever and going a mile every day to get it seemed absurd.

It was a time when the notion of drinking sea water, seeding clouds to make it rain or drinking water from someone else's waste was unthinkable.

What do you mean "when" will they be out of water, retorted Roy Bogle, Kansas State University agricultural economist.

"**THERE ARE WELLS** out there in western Kansas that haven't pumped for three years," Bogle said. "Three years ago they started pumping foam and air."

DeLynn Hay, KSU extension irrigation engineer added: "It's a process and it's begun. Limited areas are out of water and irrigation is ended. West central Kansas is well into this process."

Keith Lebbin, manager of west central Kansas Groundwater District No. 1 said, "Some places don't have domestic house wells now. They're hauling water. I know one man at Scott City who finally found more water and now pipes about two miles just to get water back to the house."

"I don't know what's going to happen. They may have to move into the towns. But most all the cities have water problems, too."

**TOUGH CHOICES** have got to be made soon, said Wayne Bossert, northwest Groundwater District No. 4 manager.

"We have to make decisions whether, for instance, we will continue pumping 350 days a year to keep water in a Sheridan County fishing



lake — a water appropriation right that was approved before the district was organized.

"We may have to say no more 24 inches of water per acre per year and limit water rights to 18 inches. But that means no alfalfa and maybe no more corn."

Bossert also speculated that wasting water now a misdemeanor, may have to be defined in detail.

"Like when it's 85 degrees and the wind is 25 miles per hour and the humidity is at a certain level — no one can run sprinklers because you may lose 20-30 percent of the water through evaporation," Bossert said. "Or maybe we'll have to say no watering between noon and 6 p.m."

**BOSSERT SAID** the groundwater

districts need a strict legal definition of what constitutes reasonable and beneficial use to appropriate water in drier areas, so rights to take water can be reduced where it is deemed unreasonable.

The 1945 Kansas Water Appropriation Act needs revisions because it encourages water use, argued many state water resource officials.

"The state law says if you don't use it (a water right) for three years, you can lose it," noted one Kansas Water Resources Board member. "But I say if a guy doesn't pump for three years, give him a pat on the back."

Added Bossert, "We need a definite interpretation from the chief engineer that if you apply for two acre feet of water and then go to a conservation practice such as irrigation scheduling or tailwater re-use and only use 18 inches, you can still maintain the right to use 24 inches."

**AS IT IS**, water resource officials said, farmers are not sure whether conserving water to stretch the life of the aquifer might force them to surrender the unused water and foreclose options to pump it later.

Part of the confusion seems to stem from farmers jealously guarding the amount of water they are allowed to pump and protecting their rights based on their conceptions of the 1945 state law.

The Division of Water Resources wrote rules and regulations seven months ago explaining how it interpreted the law and how it intended to administer it — 33 years after it was put on the books.

The division said farmers would not necessarily be forced to abandon a portion of a water right if they used conservation practices to use less water. But that word has not gotten to farmers, water resource officials said.

**SOME WATER** district managers also said farmers aren't sure what measures will be considered conservation, reducing that incentive until they are certain of the rules.

"We feel strongly about irrigation

scheduling," said James Power, director of the Kansas Water Resources Board. "The districts are looking at implementation and the universities are developing the technology. Individual farmers are realizing they're going to have to make do with much less water."

"One way the state could control the amount of water used is to come up with a concept requiring the use of the best available technology and then limit water use to what that requires," Power explained. "Everything else would be called waste and punishable as a misdemeanor."

What irks those trying to salvage the remnants of a water-dependent economy in western Kansas is that the chief engineer of the Division of Water Resources has had authority since 1945 to determine how much water use is in the best public interest.

The water in Kansas is dedicated to all the people of the state.

**TO DETERMINE** whether a water right should be granted, the chief engineer has had authority to consider the effect on the immediate area, the recharge rate of the water supply and whether it would lower the water table unreasonably.

"Generally, little or no evidence was found that the safe yield and recharge rate of an area were taken into consideration in the evaluation of an application," the Legislative Post Audit Division said in a 1975 performance audit of the Division of Water Resources.

"Data on the amount of decline of the water table did not appear to be utilized in the approval or dismissal of an application, nor the total number of acre feet appropriated to date for an area. The amount of water available for appropriation had not been calculated for use in decision making," the report added.

**AVAILABLE WATER** was over appropriated across Kansas, water resource officials said. There is no way today to determine who is using how much water and whether use exceeds the right to appropriate it.

"It's strictly on the honor system," one manager said.

Some managers say meters are essential to plan the using and stretching of remaining water.

Under the appropriation law, the chief engineer has had authority to require meters. Legislative Post Audit recommended in 1975 that the chief engineer require them on all non-domestic wells.

**THAT NEVER WAS** ordered. The chief engineer argued he had no business ordering farmers to make that kind of capital outlay and that he had no staff to enforce metering or to read the meters. Management districts also have the authority to order water metering. But they have run into stiff local opposition.

"With meters and water measuring, it can pay off in water savings, optimum yields and lower energy costs," countered the KSU Extension Service.

The state water law also is fuzzy on whether an irrigator can keep drilling supplemental wells to maintain the pumping capacity of the original well when the water table drops and the pump lifts fewer gallons of water per minute.

"What happened in Texas, where the depletion has come faster, is that as yields dropped, more and more smaller wells went down to the point you had 70,000 wells pumping in an area the same size as Kansas' Southwest Management District No. 3, where there are only 8,000," said Dave Pope, assistant to the chief engineer. "So far, when a well in Kansas drops off, the user stands a good chance of getting a supplemental well. Whether that should be allowed needs to be resolved."

**DECISIONS DURING** the next five to 10 years, Power said, have got to be political.

But, questions one water resources official, who is going to say what is reasonable or unreasonable use of remaining water supplies?

"We knew that once irrigation

(See MANY, Page 16, Col. 1)

## Water Recovery Plan Probed at Dodge

By **MARTHA MANGELSDORF**  
Staff Writer

A shortage of irrigation water, millions of gallons of sewage plant wastewater needing upgraded treatment at a cost of \$4 million and 500,000 pounds of manure produced daily might seem insurmountable problems for some cities.

But Dodge City officials think that they may be close to finessing an enterprising plan to get water to irrigators, to save the city the \$4 million investment and to produce, at the same time, methane gas from manure to supply fuel for new industries.

"We were looking at farmers' problems of water shortages and for ways to utilize the city's wastewater (4 million gallons a day) that would save us having to spend \$4 million to upgrade the sewage treatment plant," says Ed Daley, city manager of Dodge City.

"And, of course, there was big interest here in what to do with this manure," he added. "There are roughly 150,000 head of cattle in a

20-mile radius of Dodge and they produce about 500,000 pounds of dry manure a day."

**DODGE CITY** officials are exploring two options to better use natural resources. One will cost the city about \$600,000 instead of \$4 million, and the other has about a \$1 million price tag.

Under the federal water pollution clean-up laws, Daley said, Dodge City is forced to spend \$4 million to upgrade its wastewater treatment plant to continue dumping the 4 million gallons of wastewater a day in the Arkansas River.

To local officials, it didn't make sense to keep letting that much water run out of the area when local irrigators are having increasing difficulty obtaining new water rights to grow crops. It made even less sense for the city to spend \$4 million to send still cleaner water down the river.

A private group, Mesophillic Energy Re-

covery, has proposed building a methane gas production plant at Dodge City. It would gather area feedlot wastes and with the city's wastewater, produce gas and fertilizer, then sell the gas back to the city to sell to industries.

"We have several industrial prospects that would come in to Dodge if they could get gas," Daley said. "Industries here face severe curtailments from Cities Service and Peoples Natural Gas companies. The new MBPXL (beef packing and processing) plant had to go 13 miles from the city to buy gas from Kansas Power and Light Co. and pipe it back."

The gas production plant's wastewater would then be passed on to farmers to irrigate 400 to 500 acres, Daley said.

**DALEY SAID** methane gas has been used as a successful alternative to conventional fuels. He said the U.S. Department of Energy has a demonstration methane gas plant in Florida and the Farmer's Home Administra-

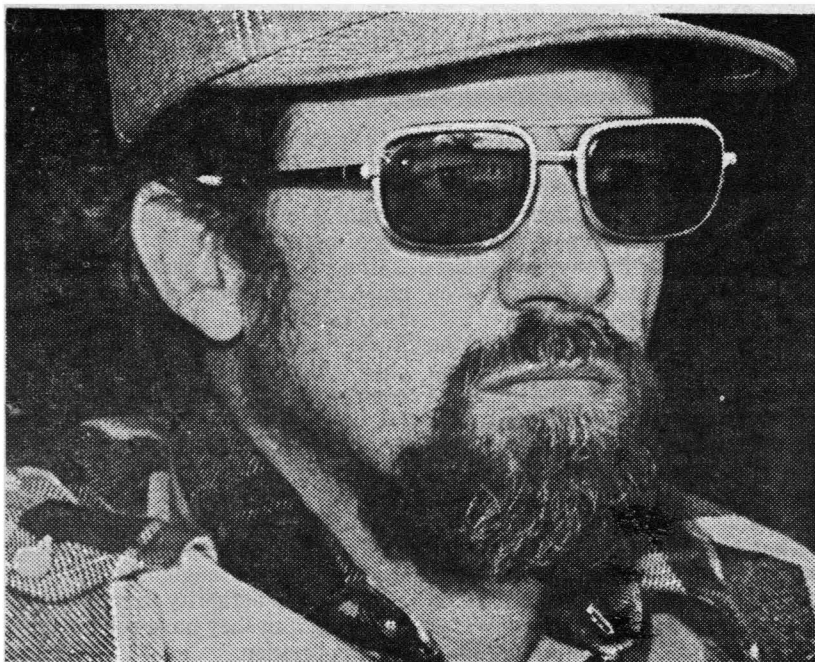
tion is financing a Lamar, Colo., plant that will produce methane gas to fuel that town's electric generating plant.

"It's been a principal source of gas in India and Asian countries for years, and it's been used for years in Germany," Daley said. "The Germans used methane gas produced from chicken manure to fuel their tanks across Poland."

The other proposal has come from the local High Plains Dressed Beef packing company. It proposes taking the wastewater from the packing plant and the city's wastewater, building a lagoon system three miles south of town and irrigating 400 to 500 acres that cannot be irrigated now because new well drilling is prohibited.

Daley said the city engineering department is completing studies of both proposals. He said the Environmental Protection Agency and the Kansas Department of Health and Environment will have to approve any alternative plan for city wastewater disposal short of upgrading the treatment plant.





Don Schwab of Copeland

# Ex-Texan Sees Hope In Water Controls

By MARTHA MANGELSDORF  
Staff Writer

"I was young and just getting my feet on the ground, but the chances of developing any kind of operation just weren't there," Don Schwab says in recalling his decision to abandon his farm west of Lubbock, Texas, and move to near Copeland in southwest Kansas.

In Texas, wells were sunk into the life-sustaining Ogallala aquifer at a more furious pace than in Kansas. The water shortage has carved into futures of Texas High Plains farming at a faster clip than of Kansas. But

some portions of Kansas are not far behind.

"The first well went down on our place in Texas in 1949, and it pumped 1,000 gallons a minute," Schwab said. "In 1963, I took over the farm, and in 1965 I pulled the well and submerged the pump to get 150 gallons a minute."

Schwab's next move was to pull up his roots in Texas — 10 years ago at age 30 — to find better farming and better water in Meade County, Kan. But he has had to lower three of his seven wells about 40 feet to irrigate his 1,700 acres of corn, milo and wheat.

"If I were sitting on undeveloped dry land, I probably wouldn't be too happy about the management district regulations," Schwab said. "But everything I've got is irrigated, so I don't see anything too wrong with them."

STILL, SCHWAB is luckier than many western Kansas farmers, and he's happy to see some protection for his 150 feet or better depths of water. In Kansas, Schwab thinks that with careful management the water will last at least long enough to give his sons, 13 and 14, a crack at irrigated farming if they choose.

"In Texas, there was no option to do anything," he said. "Unlike Kansas, in Texas, the water belongs to the landowner (like a mineral right), and there are no limits on what you can do with your water. There are no spacing or pumping limits. No controls. Without the controls here, you'd see more and more wells drilled, more and more punched down, and you'd see the same thing happen here that happened in Texas."

"It's hard to measure whether Kansas (water rights) laws are better than in Texas. In west Texas, you probably got more total economic benefits faster with no water regulations. But then they're out of water. Here, the economic benefits have been at a slower, steady pace."

Schwab is a firm believer in Kansas farmers being required to meter wells "for our benefits."

"I USED ONE last year and the results were pretty poor in terms of what I thought I was using and what I was actually using," he said. "I found I was using twice as much as I needed in some cases in preplant irrigation, and one third more summer water than I should have been. Now I'm looking awfully hard at the delivery system."

For Schwab and other Kansas farmers, it is becoming more imperative to know exactly how much water it takes to produce an optimum yield off the fields. Every unnecessary gallon of water pumped is dollars lost.

"If you've got your land paid off and aren't renting any, you can make money, but the rest of us are just breaking even with prices the way they are and costs of operation and the yields we've had," Schwab said.

"For irrigators, a real wet year would help so much. We had to pump 30 days more than normal last year because it was so dry, and having to add \$12,000 to \$13,000 more in fuel costs onto the cost of operation at the end of the year doesn't help at all. There has been a decline in our net worth statement the last four years."

## In Water Saga

# Many Choices, but No Solutions

★ From Page 15

started, mining — or taking more water than what is recharged — would ensue," he said. "It was just a question of how fast. We built a \$3 billion industry. Kansas finishes (for processing) 10 percent of the nation's beef with irrigated crops. Who is going to draw the line?"

Groundwater district managers said water allocation will come in some areas sooner than most people are willing to face.

"But you have to understand," Lebbin said, "people out here still believe farming is a free enterprise, and they get very touchy and up in arms if you try to dictate what they can do."

Another state water official said: "In reality, you can't get irrigators to quit without strict enforcement controls and monitoring because they're hooked on irrigation and they want to maintain it to pay off investments."

LEBBIN EXPLAINED: "A lot of old-timers here feel it is far more economical to use the water now and to hell with tomorrow. But a large number are very concerned."

Lebbin and other managers hope they can convince farmers to join together and voluntarily reduce pumping to hang on to an area's economic lifeblood a few extra years.

Irrigators are taking steps to save water. They schedule water, applying it only at the scientifically set stages of growth in a crop when it will do optimum good.

They are encouraged to use soil moisture monitoring devices, some of them as cheap as \$1.20 an acre, to figure exactly when to water.

KSU said if an irrigator can save an inch of water application on a 130-acre center pivot system with a 900 gallon a minute well, fuel savings alone would be at least \$50 an acre.

BUT FOR MANY irrigators, the wells already pump too little water too slowly to consider scheduling. Some must pump nearly all year to

get enough water into the soil to keep a thirsty crop alive.

Researchers are developing more drought-resistant hybrid seeds but, Hay said, it is not moving fast enough to be the answer when Kansas' water is gone.

Some farmers dream of an Alaskan oil-type pipeline that will bring water to the western part of the state. But geologists and some state water resource officials say it is just that — a pipe dream.

"The costs are prohibitive," says Bill Hambleton, director of the Kansas Geological Survey. "It's uphill all the way (about 1,500 to 2,000 feet.) And besides, who in his right mind would give it up?"

Federal water importation studies say importing water could cost more than \$100 an acre foot and a separate study estimates costs as high as \$400 an acre foot. Farmers now pay about \$10 to \$30 in fuel bills per acre foot for water.

IF THE STATE decided enough was riding on its irrigated western Kansas economy to subsidize importation, why, asked one water resource official, would it pipe water all the way to the western border when central Kansas soils are better suited for crops and would yield more for the investment.

The groundwater management districts have appealed to the state to invest more in weather modification and rainfall recharge programs in central and western Kansas.

"People here pay exorbitant tax bills for limited returns," Lebbin said. "The bulk of the state aid is distributed on population formulas and a high amount of our tax money never returns here. We have a \$1 million proposal to assist the districts with recharge and we'd like to see some of that tax money come back in weather modification help."

Some resource officials discount the results of recharge and weather modification — cloud seeding — experiments.

"If recharge is only about three inches a year and you're taking two to

four feet of water out of the ground annually, it's going to take eight to 16 years to recharge that much," Hambleton said.

But Lebbin vehemently argued: "Weather modification resulted in a 30 percent reduction in hail annually and it has increased soil moisture by 10 to 15 percent. Just try to put a value on an inch of water out here. A 30 percent reduction in hail may mean a savings of as much as \$15 million. Hail suppression can be valuable across this state."

"Recharge studies show some pretty phenomenal results," Lebbin added. "By treating dry land to enhance its capability to retain all rain, you can get 40 bushels of wheat or better an acre."

THE GOVERNOR'S Task Force on Water Resources has recommended the Legislature commit \$1 million over five years to artificial recharge projects and additional state technical and financial assistance to the groundwater management districts.

For those who are resigned to the fact the water will be gone shortly, there is increasing interest in a pending lawsuit filed by three families named Gigot of Garden City.

The Gigots argue irrigators should be able to take a groundwater deple-

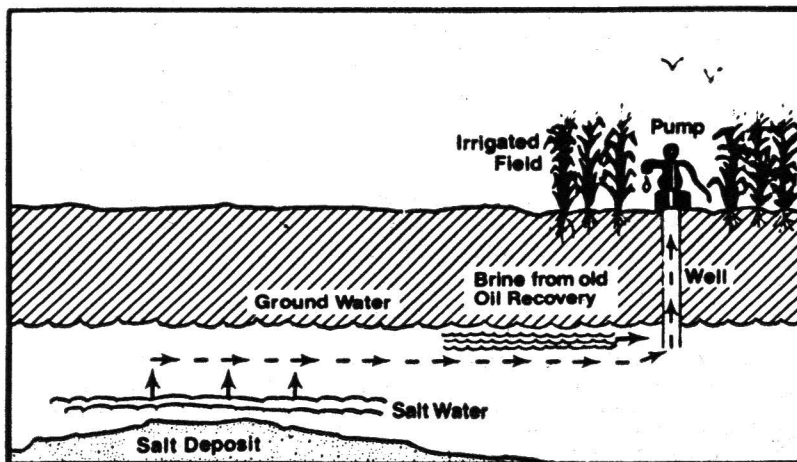
tion allowance the same as the Internal Revenue Service allows for mine, oil and gas well and timber depletions. The Gigot families are seeking \$33,645 in tax refunds based on deductions computed for 1973-76.

The Gigots figure, that based on groundwater depletion rates, annual tax deductions could range from \$40 to \$300 for each foot of decline in water under each acre.

"You will find people in western Kansas for whom one-fourth to one-third of their gross product is tied to irrigation," Power said. "Farmers have the alternative when the water runs out of going back to dryland farming, although they will suffer the consequences."

But the state will suffer, too. A \$6 million study underway now of the ramifications of depleting the Ogallala aquifer in all the High Plains states should pinpoint what the states face socially and economically as the water is drained.

The groundwater district managers are on the cutting edge of this crisis and they are doing a tremendous job, said one Kansas Water Resources Board member. What remains to be seen is whether the state can keep pace with the managers' fast-break game or prefers to stall until the clock runs out.



How salt gets into water



# CONCLUSION: *Water Intermission Won't Last*

By MARTHA MANGELSDORF  
Staff Writer

In this huge amphitheater called Kansas, it is intermission in a classical tragedy.

Some farmers, city managers and state officials can see what is developing as the water runs short, but many seem helpless to prevent the final act from being played out.

Rewriting the script will be difficult.

"I am convinced that this water crisis is going to dwarf the energy problem as a real national crisis," says former Lt. Gov. Shelby Smith of Wichita, who chaired the two-year Governor's Task Force on Water Resources investigation of dwindling water supplies in Kansas.

"There are no alternatives and no substitutes for water like there are energy alternatives," he said.

**THE 26-MEMBER** task force recommendations are enroute to the Legislature. Both Senate President Ross Doyen, R-Concordia, and House Speaker Wendell Lady, R-Overland Park, promise to take notice.

"The time is ripe for an interim committee of the Legislature to take advantage of the information produced by the task force," says Lady. "We're heading for real trouble if we don't do something about allocating water rights and restricting usage. Perhaps this thing has been left too long to people with vested interests and they are not able to look at the whole picture."

Doyen agrees. "The facts are in hand. It's time to start making some decisions. We should have started yesterday."

Smith says one problem that seems to have hamstrung water management in Kansas for decades is the fragmentation of responsibility.

The task force found nine state agencies with major concerns in water management and 522 special water districts with some responsibility. Those districts include 93 drainage districts, 105 county conservation districts, 229 rural water districts, seven irrigation districts, five groundwater management districts and one wholesale water supply district.

In addition, Smith said 2,200 local governments — cities, counties and townships in Kansas — have water management responsibilities.

"**THIS IS** one Kansas," Smith says. "You can easily divide this issue into east and west, urban and rural. But this is too much for anyone to play games. Any political figure who wants to be parochial about this is doing his community and the state a disservice."

The former lieutenant governor is quick to emphasize there is a role in water management for local citizens where a problem is unique to a locality.

"This thing is so fragmented in Kansas that the governor doesn't really have the control he needs to plan in this area," Smith says. "It took us two years of study on the task force just to figure out who the players were. There have got to be initiatives at the state and maybe even at the federal level because, for



with no way to respond.

"We need to come up solutions that are practical from a political point of view so that if we need the support of the Legislature, we can get the votes."

Doyen has some specific ideas in mind. He would like to see the state invest more in Kansas State University research distribution. The Senate president said KSU has compiled detailed information on the exact amounts of water crops need at specific growth stages and on what varieties of crops respond best to more limited water.

"This state should initiate a real conservation program," Doyen said. "Maybe it's time to start reducing yields 10 percent to a more optimum yield that will save water."

"Domestic waste also involves a tremendous amount of water," he adds. "Perhaps we could look at municipal water pricing structures, figure what an average household should use on a normal basis and if it exceeds that by thousands of gallons, let them pay accordingly. Right now, the pricing is reverse."

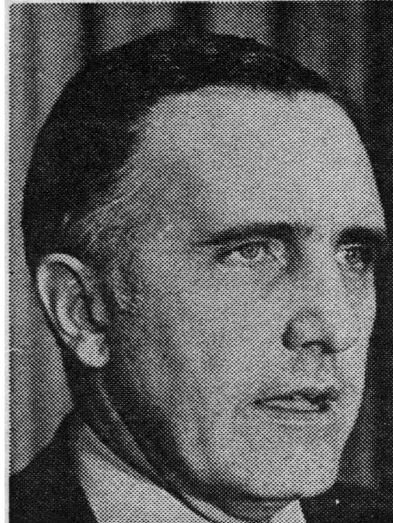
The Concordia lawmaker and farmer has also noticed the difficulty some cities face in trying innovative systems to conserve or recycle and use water more than once.

"**PERHAPS THE** state needs to provide some of the tools for the cities to bond or finance these projects," Doyen says. "There is a lot of money circulating in the state treasury that is not used and maybe the state could buy some of those local bonds. We might lose some revenue by not investing in higher interest bonds, but maybe it's time we help the people in other ways."

Doyen also says the state should consider defining water waste more specifically, such as prohibiting sprinkler irrigation systems from being run during hot afternoons when 30 to 40 percent of the water might evaporate.

Smith said another significant conservation tool the state or local groundwater management districts should impose is water metering to be certain irrigators use no more water than is essential.

The chief engineer of the Division of Water Resources has had authority since 1945 to require metering and the Legislative Post Audit Division recommended in 1975 that he order metering.



SHELBY SMITH  
... "National crisis"

Despite an interest for an interim committee to develop recommendations for the next Legislature, the final decision-making process for the full Legislature promises to be difficult.

"The sense of urgency in the Legislature anyway, I don't believe, is there," says Rep. Mike Hayden, R-Atwood, who chairs the House Ways and Means Committee.

"**AS MUCH** trouble as there might be," adds Hayden, who represents four northwest Kansas counties, "I have never had a single person in my district saying he wants more controls from the state. There may be an increasing problem, but people are not turning to us to solve it. In the absence of that cry, I don't think the Legislature wants to act until the people come forward."

"In a free enterprise system, you've got to let people develop their own economic alternatives and the people feel that it is their constitutional right to manage their own affairs," Hayden says. "They have the right to achieve economic opportunity if it is there and, at this point in time, I feel it is the right of the individual to develop that. If that philosophy proves wrong, it could be a disastrous situation in the years ahead, but that's what the people want."

Hayden said he sees more conflict developing now between people who want to use water for recreation and those who want to use it for irrigation or another purpose.

"Kirwin, Webster, Norton and Cedar Bluff federal Bureau of Reclamation reservoirs are facing serious water depletion because irrigation is reducing the amount of water that seeps into the streams and creeks that feed those lakes," he said.

Ken Brunson, stream investigation and development biologist for the Kansas Fish and Game Commission, says the agency is completing a detailed assessment of the wildlife habitat losses in Kansas where water supplies have dwindled because of irrigation.

The commission report and recommendations will be incorporated in the State Water Plan, a document that the Kansas Water Resources Board is revising to present to the Legislature in several packages beginning in 1980.

"**THERE'S A** resource in the Arkansas River that is essentially gone," Brunson said. "Without it, the fish and wildlife can't survive. The Whitetail and Rio Grande deer are essentially being lost."

The biologist said the water and habitat situation is becoming so critical at Kirwin Reservoir, about 60 miles northeast of Hays, that Canadian geese and the whooping crane, a nationally recognized endangered species, are threatened.

Brunson said virtually all state lakes in western Kansas are dry now.

"Lake McKinney in Kearny County used to hold a couple thousand acres of water, but within the last year we relinquished it and what used to be water is now a corn field," he said.

Brunson says even the state tree, the cottonwood, which for decades stood as a tall sentry above the river valleys protecting Kansans from the elements, is dying along the Arkansas River because irrigation has severely reduced the amount of water seeping into the river and the land along its banks.

The water supply crisis is becoming visible fast, and hard decisions must be made on how remaining water will be used and on what the tradeoffs must be, a Kansas Department of Economic Development planner says.

**THERE ARE** decisions to be made by the state, by cities and by individuals.

Cities are not exempt from the new well drilling and withdrawal restrictions of groundwater management districts that aim to curtail water development. Yet few cities have made definite plans to buy land or water rights or firmed up options to secure stored water in reservoirs to cover growth.

Cities that dally in making decisions will have no option but to condemn water rights, strangling the farming enterprise that insulates them from economic ruin.

There are only five counties in Kansas where cities told the Kansas Water Resources Board surveyors they did not anticipate a water supply problem in the next 10 years.

Yet revenues are not being raised to finance the inevitable high costs of obtaining more water. Despite impending shortages, few cities have

(See WATER, Page 18, Col. 5)

## The Authors of Water Series



Mangelsdorf



Freiberg

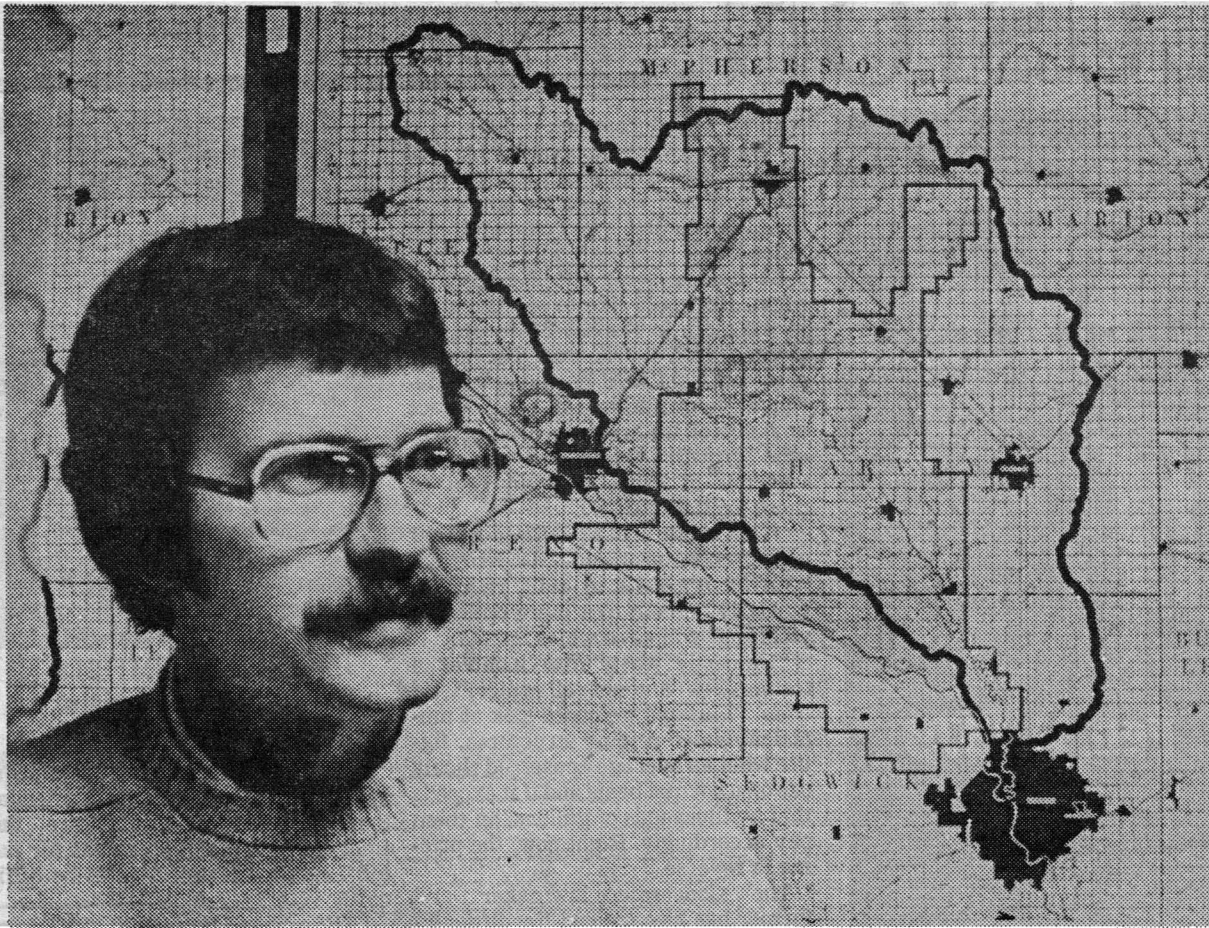
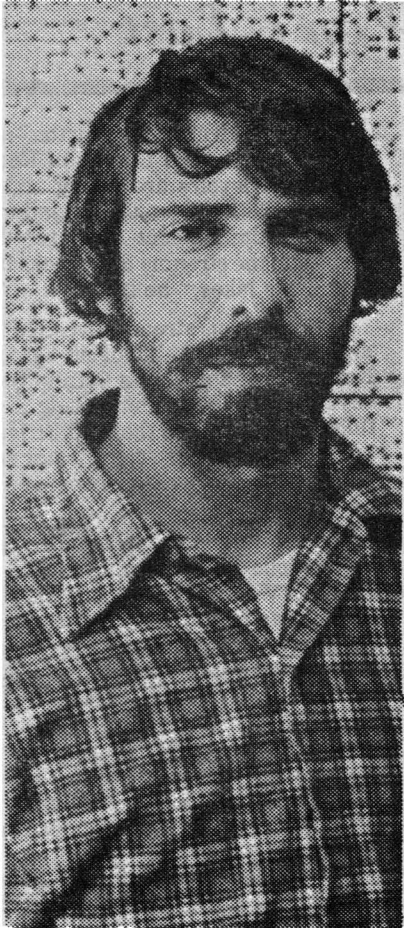
Martha Mangelsdorf is a native Kansan who grew up in Prairie Village and attended the University of Kansas.

With the exception of one year, her professional career has been spent with Kansas media. Before coming to the Wichita Eagle and Beacon in September 1978, she worked two years for Kansas television stations; for Harris Enterprises, a chain of Kansas newspapers; and for nearly three years as a statehouse reporter for United Press International at Topeka.

Karen Freiberg has been the newspaper's agriculture writer for the past nine months. An Iowa native, she attended the University of Northern Iowa.

She worked for newspapers in three states, including Iowa, California and Minnesota before moving to Kansas. Her experience as a journalist has taken her from the tomato fields and vineyards of northern California to corn and soybean fields in Minnesota and Iowa.





Central Kansas Groundwater District Managers: Richard Sloan (left), Tom Bell

# Water Rewrite Difficult

★ From Page 17

drafted water conservation plans or elaborate measures to recycle water for additional uses.

Water becomes more precious, but water protection policies still haven't been hammered out at the state and local levels of government. Traces of septic tank and feedlot wastes, pesticides and fertilizers turn up in the groundwater, but the groundwater recharge areas are still largely unprotected.

**IRRIGATORS FACE** stark options. If they turn a deaf ear to the groundwater managers' pleas to band together to reduce water use voluntarily, they may collide head-on with mandatory across-the-board cuts in water rights or a complete cutoff in rights beginning with the most junior ones.

If they don't invest in water meters and soil moisture measuring devices to apply water with the exacting precision of a French chef, the ingredient may be exhausted before mortgages and other debts are paid.

Kansas is on the threshold of dramatic changes in her very essence. Yet those trying to preserve the resource most fundamental to the quality of life Kansans have achieved labor under some fuzzy state laws or state laws that fall short of meeting today's needs.

Today, it is not difficult to document where Kansas' farms, businesses and households are beginning to suffer the initial hurts of vanishing water supplies.

Today, it is easier to understand the significance of the prayer displayed in the home of a Marienthal, Kan. farmer:

"May the rains fall soft upon your fields and . . . may God hold you in the palm of his hand."

## Glamor Going Out of Corn

★ From Page 13

omy, corn is crumbling. It remains to be seen whether farmers and industry can adapt before the economic structure decays.

**THERE ARE SIGNS** of change, and there are signs of resistance.

That the water will run out, eventually, is inevitable.

"We know that, or at least we think we do," said a Deerfield farmer. And with it will go the corn.

The first step away from corn is usually to limited-irrigation grain sorghum — requiring about half as much water as corn. Net profits per acre can be reduced by as much as \$30, or \$5,000 per quarter section.

For some farmers, the change will conserve enough water to continue irrigation in a limited vein for many more years. For others, grain sorghum will soon be followed by irrigated wheat and then dryland cropping.

"I SUSPECT the majority of the farmers will survive one way or the other," said Wallace Robinson, a Scott City farmer. "They will go through kind of a rough period, but they will make the transition to dryland."

Robinson is an ex-corn grower.

He admits that in the same tone of voice he might use to divulge a well-kept secret. He stopped growing corn because he had to, not because he wanted to.

Three years ago, Robinson faced the decision to change from corn to less thirsty irrigated crops when he learned that 75 percent of his water supply had been depleted after years of irrigation.

It wasn't an easy decision.

"I DID IT with a lot of misgiving the first time," he recalled.

Farmers across western Kansas are finding themselves in similar circumstances.

"I think you'll see considerably less corn planted out here this year," said Ivan Koop, a Ulysses farmer. Koop said he plans to "switch 20 to 30 percent of our acres" from corn to grain sorghum in 1979.

Still, the attraction to corn is a strong one, and a habit that won't easily be broken, for several reasons.

"There's a psychological factor involved," says Robinson. "It's fun to grow. It's beautiful. It makes us feel like we're in Iowa. It's also less trouble to harvest than milo."

**BEYOND THAT**, corn has a tight grip on the farmers' bankbooks.

Although Koop wants to cut back on corn production, he says he can't afford to. He will continue to raise corn as long as his wells pump water.

"If we had decent prices for our crops, we could afford to plant less. As it is, we can't afford not to plant it," says Ivan's father, Ira.

For cattle, corn remains the preferred feed, says feedlot manager Pat Koons, Kearny County Feeders Inc., near Lakin.

"If comparable in price to wheat or milo, we'll feed corn because it's easier to work with, has more energy value and gives us better performance on rate of gain," he said.

Corn normally costs more than milo.

**FOR FEEDLOT** operators "spoiled" on corn, changing the ra-

tions to wheat and milo would cost money and time, he said.

Before cattle can digest either wheat or milo, it must be processed, which requires a great deal of energy, which drives up the cost of the feed.

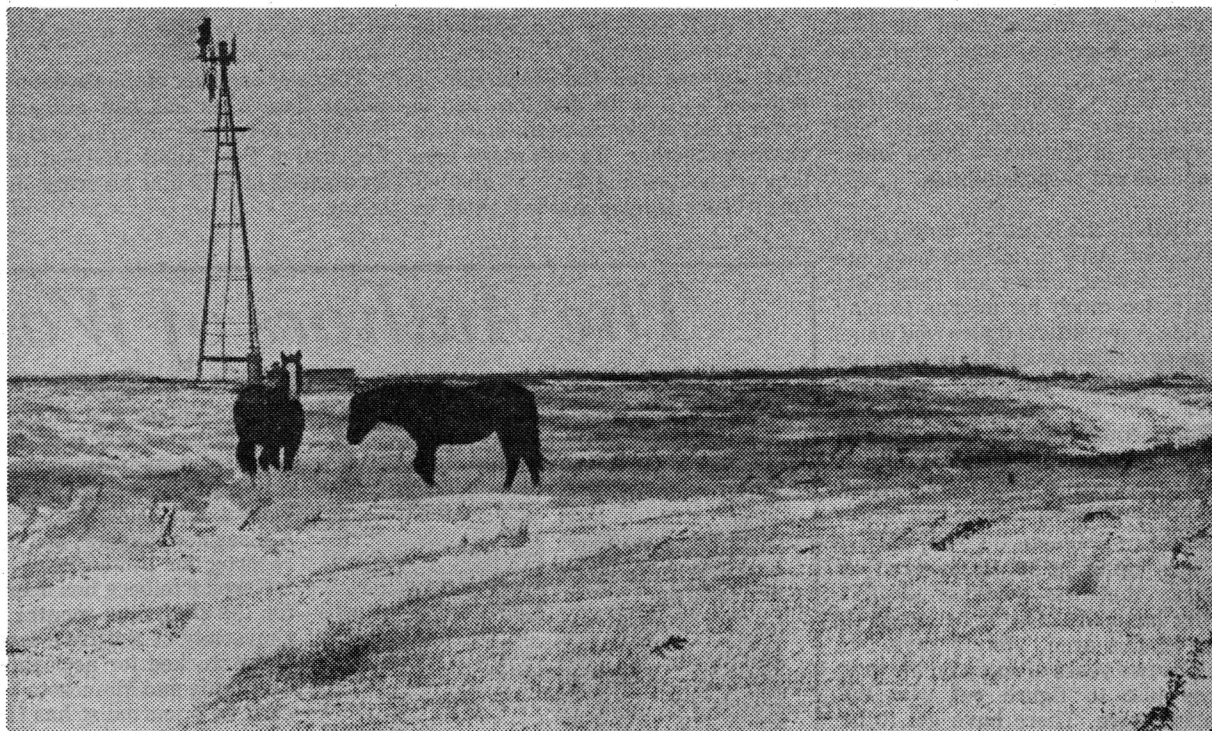
Wheat is high in protein and an excellent feed if fed in moderation, said Albert Hoeme, manager of HRC Feed Yards near Scott City.

Koons said that, without corn, cattle would have to spend more time on feed to reach a choice grade. That too would drive up cost of production.

Both Koons and Hoeme, as well as Sam Brookover of Brookover Cattle Co. near Scott City, said it would take more than the loss of corn to drive the feedlot industry out of western Kansas, however.

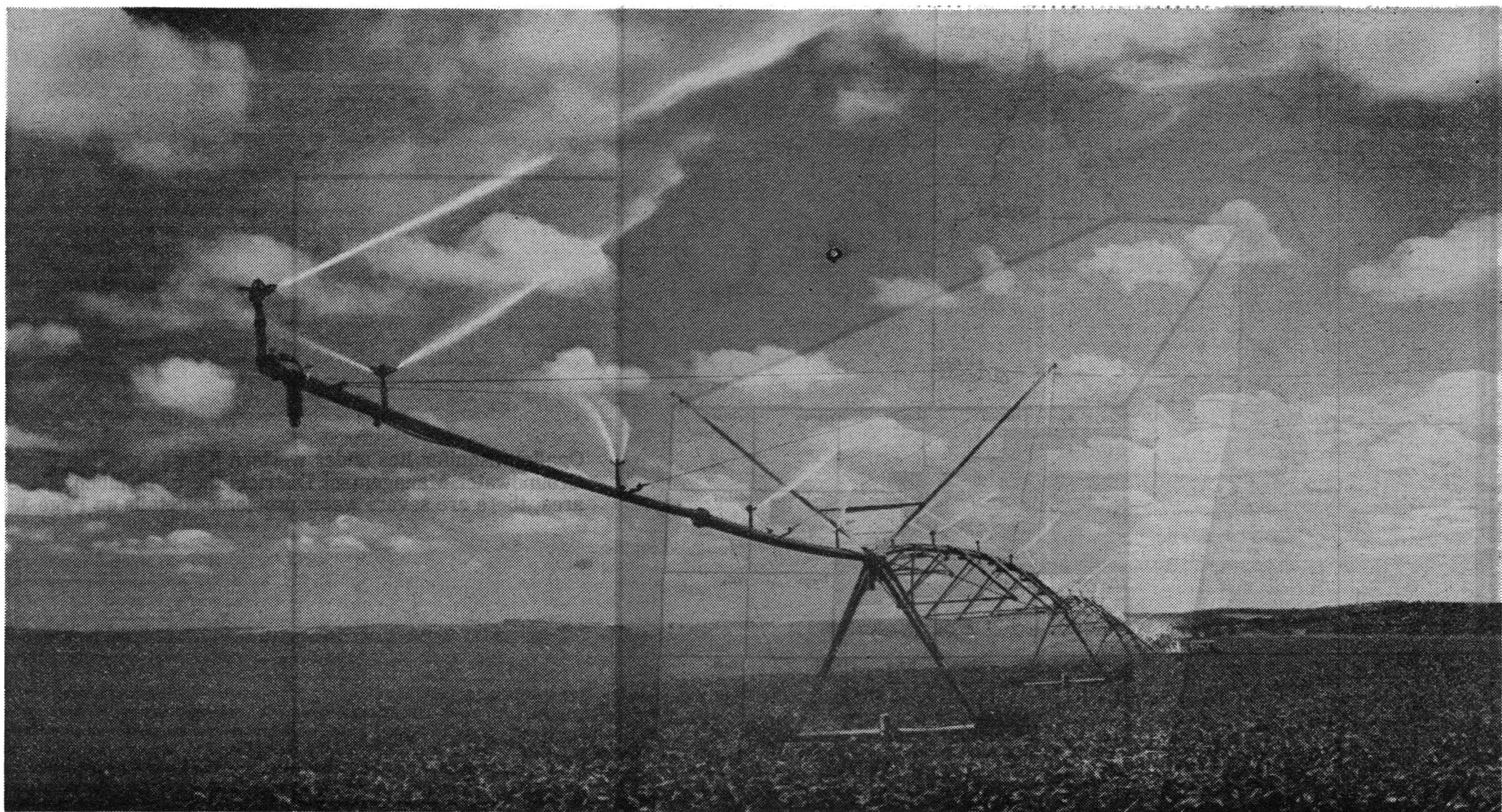
"When the water runs out, there will be a lot of dryland milo and wheat grown here, and that's good to make cattle fat on," said Brookover.

"The climate here — with less humidity — is too great a drawing card to leave," said Hoeme.



It's peaceful just south of Garden City





*An Editorial*

# Crisis: Warning That Must Be Heeded

An editorial published in the  
Wichita Eagle on Feb. 14, 1979

In some ways, Kansas' water crisis is a lot like the energy crisis that burst onto the American consciousness early in this decade and has been flickering in and out of focus ever since. Both situations involve what once were thought to be virtually inexhaustable natural resources; both have seen hidden underground supplies exploited — pushed harder and harder to produce more and more; and both have seen a dependence created by overuse and the hardship that follows when it suddenly becomes clear that there is a finite amount of liquid that can be sucked into a pipe and pumped out for the benefit of people.

Wichita Eagle reporters Martha Mangelsdorf and Karen Freiberg recently completed an extensive eight-part series on the water situation in Kansas. What they found leaves little doubt: The state is well on its way into the crisis stage of a serious water problem.

Water has always been an important Kansas natural resource. It is becoming a precious natural resource, as well, as greater demands on it from both agricultural and municipal users have mounted.

There are many factors that have affected Kansas' water: the groundswell of irrigated

farming that sapped aquifers faster than they can recharge; brackish pollution from oil field salt water disposal wells and natural saline deposits that increasingly threaten pure supplies as more fresh water is pumped out; the unwise use of water by those who assumed that because it was always plentiful in the past, it would be so, too, in the future.

It's clear now, though, that if Kansas uses up water faster than it can be returned to the land, and then compounds the problem by polluting some of its sources, there will come a day when the taps will go dry. Luckily, there has been a warning given — in the form of detailed groundwater studies and use projections — that spells it out: Water demands are fast outstripping water supplies.

That warning must not go ignored. And there are signs it is being heeded. Fewer new wells in hard-pressed areas are being approved. Engineers are seriously studying groundwater pollution. The old concept of pricing water cheaper the more that is used is coming under scrutiny. And lessons are being learned from towns that have been forced to ration water during peak demand periods and, in some cases, rely on water supplies tanked in from other cities that haven't come face-to-face with the same problem — yet.

Fortunately, there is one particular in which

the water shortage differs from the petroleum shortage: Given a chance, the natural water system will recharge itself. But for that to happen, there must be a realization that demands on the state's water resources have to be brought in line with its supplies of water.

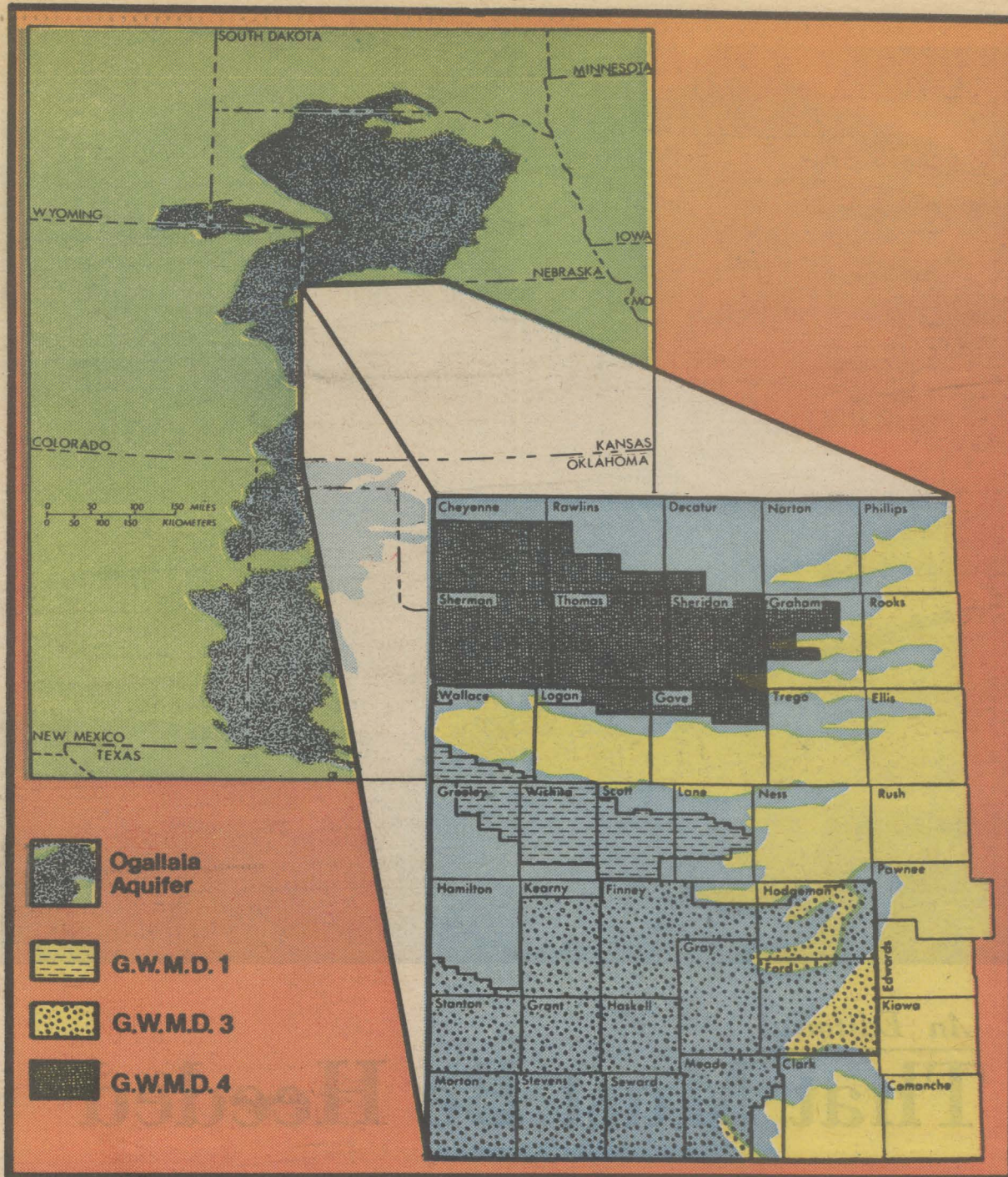
And, unpleasant as the prospect may be, that may well mean a return to dryland farming in some areas that now thrive because of irrigated corn production and the cattle feeding industry that often accompanies it.

It obviously means an organized approach, such as the groundwater management districts organized in the last few years, will have to be applied to the problem. It will mean people accepting the limitations of the water supply as a reality, and then working to conserve what is available and put it to the best use possible.

Mostly, it will mean planning for the future. Kansas did not get in the shape it is in today with its water because of poor planning. It got in this shape by an almost complete lack of planning.

There can be no more 30-year delays in implementing water management plans. To Kansas farms and cities alike, water is the lifeblood of the future. If it is lost, the future will be lost as well.

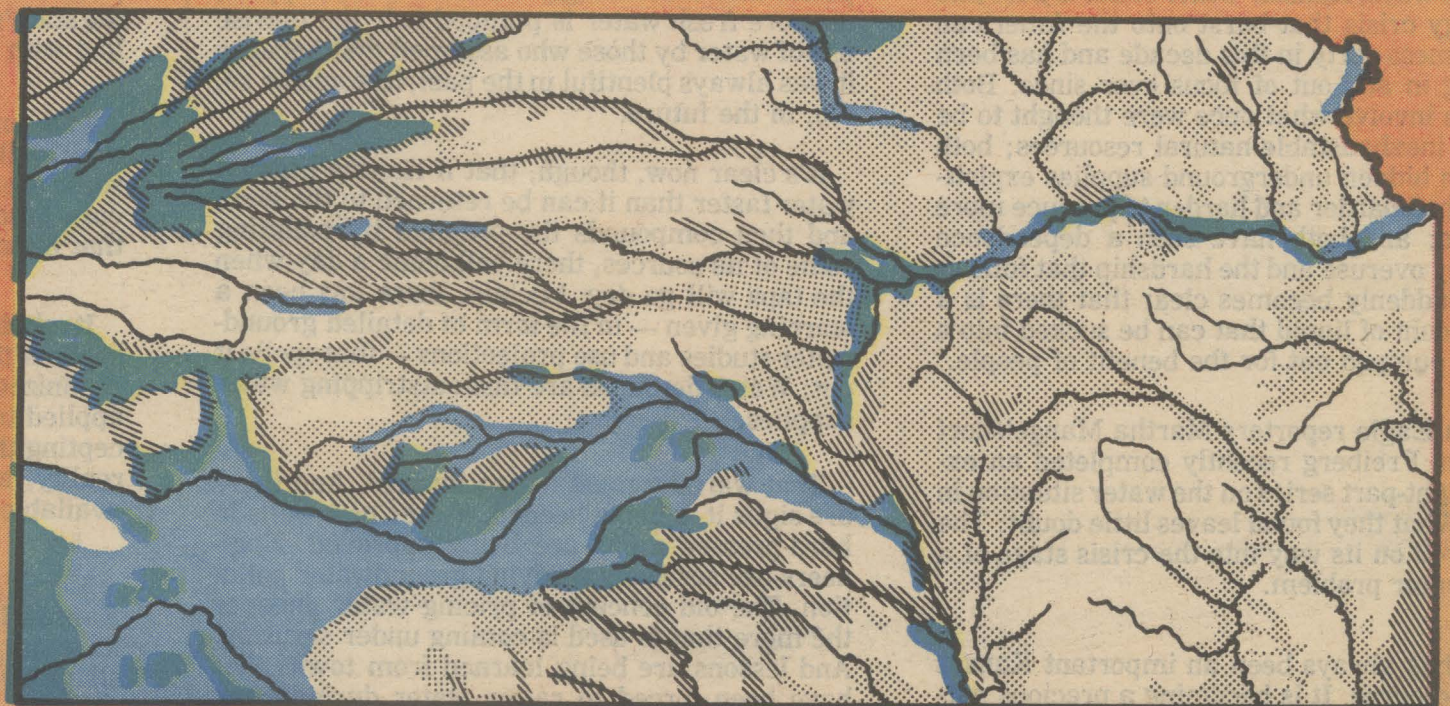




Ogallala Aquifer lies under western Kansas and the three Groundwater Management Districts there. In much of the area, there are severe water problems. **Details on Page 3.**

Graphics by Judy Stanley

## GENERALIZED GROUNDWATER YIELDS



0 to 10 gpm\*    10 to 100 gpm    100 to 500 gpm    500 to 1000 gpm    Over 1000 gpm

\*Gallons per minute

Intensity of water problem is shown in this map. The lighter the area, the less water there is. **Details on Page 9.**