Alternative #4: Enact legislation establishing a Groundwater Depletion Payment.

To Stabilize or Reduce the Rate of Development

Alternative #5: Enact legislation increasing state funding for research and educational activities to improve irrigation practices.

Alternative #6: Enact legislation providing financial incentives for improved irrigation practices.

Alternative #7: Enact legislation requiring irrigators to adopt improved irrigation practices.

Alternative #8: Enact legislation requiring groundwater withdrawals to be restricted in problem areas.

Alternative #9: Enact legislation requiring groundwater development to be restricted in problem areas.

Alternative #10: Enact legislation establishing a fee for withdrawing groundwater.

Alternative #11: Enact legislation authorizing increased state appropriations or issuance of bonds for development of supplemental water supplies.

The Natural Resources Commission favors a strong stance on protection and development of the state's valuable groundwater resources. After considering public input on the alternatives, the Commission adopted recommendations to control depletion of this resource. In brief, the Commission expressed the following beliefs:

(1) We should move beyond the policy expressed in the Groundwater Management and Protection Act.
(2) We should strengthen the ability of NRD's to manage groundwater use and development.
(3) Control areas should be required if "problem areas" develop.
(4) All NRD's should develop management plans based on the best information currently available.
(5) Among other things, NRD's would identify the principal aquifer(s) and a definition of what constitutes a problem area.
(6) The legislature should adopt a maximum allowable depletion rate which we recommend be no greater than 5 percent over a five year period.
(7) The role of director of Department of Water Resources in control area designation should be limited to technical review of management plans.
(8) If NRD's fail to submit management plans, sanctions might include withholding of funds for resources development or water conservation.
(9) An NRD that fails to make a timely request for a control area designation would be subject to civil suit.
(10) The research and educational programs should be strengthened by better coordination and emphasis.
(11) The legislature should grant NRD's authority to impose penalties on water users who exceed allocations.
(12) Authorizing issuance of bonds and increased state appropriations for the development of supplemental water supplies is an essential component of groundwater reservoir management.
(13) Moratorium authority is a necessary management option.
(14) The question of basing allocations on irrigated acres or irrigable acres should be determined at the local NRD level.

Invaluable Water

Nebraska is fortunate to have an abundant supply of good quality groundwater. The Natural Resources Commission believes that this vast groundwater resource should be utilized, but this utilization must be tempered with proper management to ensure that waste is minimized and gains are maximized. Improper management of this resource could lead to serious problems for portions of Nebraska's agriculturally-based economy. Proper management will allow future generations of Nebraskans to continue reaping the benefits of this invaluable source of water.

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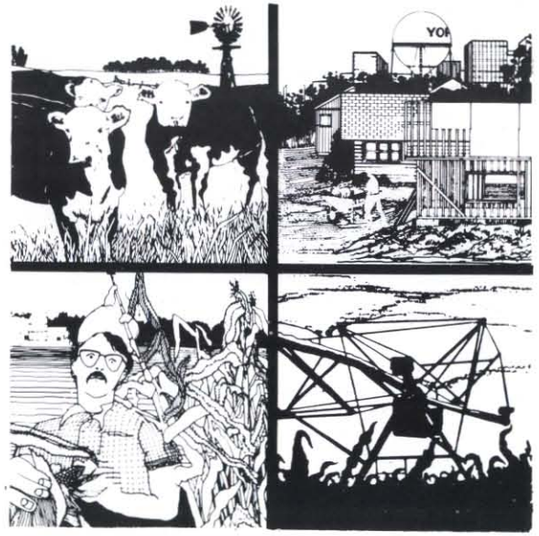
POLICY ISSUE STUDY ON

GROUNDWATER RESERVOIR MANAGEMENT



State Water Planning and Review Process

Nebraska
Natural Resources Commission

GROUNDWATER RESERVOIR MANAGEMENT

A center pivot irrigation unit slowly circles a field, supplying water for a portion of Nebraska's abundant corn crop. A rural housewife turns on a faucet and fills a glass with clear, cold water. A windmill catches the plentiful plains wind in its blades and pumps water from the ground for thirsty livestock.

Each of these scenes is an example of a use of Nebraska's plentiful groundwater supply. Uses are many and varied, but nearly 90 percent of groundwater use is for irrigation. Questions involving the management of groundwater have been heard with increasing frequency as this valuable resource is developed. With this in mind, the Natural Resources Commission has prepared a report entitled "Policy Issue Study on Groundwater Reservoir Management." The report reviews the physical characteristics of Nebraska's groundwater reservoirs and describes management policy alternatives and their impacts. This brochure briefly summarizes the report and the Commission's recommendations for the various policy alternatives. The report is available from the Commission upon request.

Importance of Irrigation

Agriculture is the backbone of Nebraska's economy. In 1980, Nebraska ranked 6th in the nation in total agricultural cash receipts. The importance of adequate supplies of water to support this agricultural system is inestimable. Nebraska also ranks third in the country in total irrigated acreage, surpassed only by California and Texas. Nebraskans are well aware that adequate precipitation cannot always be counted on, and the substitute for this lack of precipitation is irrigation.

Groundwater provides more than 72 percent of the water supply for this irrigation. In most areas of the state, adequate supplies of water exist for irrigation. In this respect, Nebraska is fortunate. Appropriate management of this valuable resource is clearly in the best interests of Nebraska's citizens.

Constraints on Groundwater Development

Groundwater is found in geologic formations called aquifers, which are water-bearing beds of permeable rock, sand, or gravel. Up to 10,000 feet of sedimentary rock underlies Nebraska, all of which contains differing amounts of groundwater in various aquifers.

The Ogallala aquifer, one of the nation's major aquifers, lies beneath great expanses of Nebraska, Colorado, Kansas, Oklahoma, New Mexico, and Texas. This vast water resource has been primarily responsible for the dramatic increase in irrigated agriculture in this region since the 1950's. This unprecedented increase transformed millions of semi-arid acres into a highly productive agricultural economy producing crops for both the U.S. and world markets.

It is estimated that Nebraska overlies nearly 1.9 billion acre-feet of recoverable groundwater of good to excellent quality. This enormous quantity of water is not evenly distributed throughout the state. Some areas have none; in some areas the groundwater reservoir exceeds 1,000 feet in saturated thickness.

Groundwater in Nebraska generally moves slowly southeastward, although the cone of depression caused by large withdrawals may alter this direction of movement. Rates of lateral movement range from several feet per day in gravel deposits to as little as a few inches per year in fine grained materials. Since vertical movement is much more rapid, most groundwater recharge results from infiltration of precipitation falling within the area or from surface water applied to the land.

Although most groundwater in Nebraska is of good quality, nitrate contamination from agricultural practices has caused problems in some areas. In other areas, the only available aquifer may produce water of naturally poor quality. Specific sites may face health or environmental hazards due to certain constituents present in very low concentrations.

Potential of the Principal Aquifer

Planning for the future development of Nebraska's groundwater resources needs to take into account differences in various areas of the state. The amount and quality of recoverable groundwater, variations in the abilities of the geologic formations to yield water, and land suitability produce differences in the potential for future development. For instance, eastern Nebraska has primarily fine grained materials which yield water slowly and are usually suitable only for low volume rural domestic supplies.

In some portions of the state, the groundwater reservoir appears to have great potential for future irrigation development. In these areas, quantities of groundwater in storage appear to exceed potential demands over a significant period. For some of these cases, even maximum utilization for irrigation would not cause aquifer exhaustion for 200 years or more. Withdrawals will result in some combination of decrease in storage, increase in recharge, and decrease in natural discharge.

In other areas of the state, there is a high potential for a dramatic reduction in groundwater in storage. Development in some of these areas is already well underway, and substantial declines in water table levels have occurred in some. These trends emphasize the need for management based on detailed evaluations.

Current Groundwater Law

Groundwater development and use in Nebraska is monitored by local natural resource districts and through state programs by the Department of Water Resources (DWR), the Department of Health, and the Department of Environmental Control. The DWR administers several programs addressing aspects of groundwater development and use. Natural resource districts (NRD's) are responsible for development of groundwater management policies dealing with groundwater mining. NRD's have exclusive authority to initiate the process of the designation of groundwater control areas by DWR. They also regulate groundwater development and use within these control areas.

Since completion of the Groundwater Reservoir Management report, legislation has been passed which provides for extensive changes in procedures for groundwater management by NRD's.

The right to use groundwater in Nebraska is, with a few exceptions, based on land ownership. Groundwater use is subject to a number of statutory requirements. Exceptions to this general rule involve situations where a DWR permit is required to develop and use the water. These exceptions are: (1) groundwater withdrawals from pits within 50 feet of a stream; (2) the use of groundwater in another state; (3) the use of more than 3,000 acre-feet per year for industrial purposes; and (4) installation of new wells in groundwater control areas.

Alternatives and Recommended Policy Changes

The Commission recognizes the need for modifying legislation in the area of groundwater management. The Commission report, "Policy Issue Study on Groundwater Reservoir Management," includes policy alternatives for use in guiding this new legislation. Alternatives in three general categories of development are examined in the report, and the following list of policy alternatives is grouped accordingly. The alternatives are:

To Maintain Current Rate of Development

Alternative #1: Enact no new groundwater management legislation and do not modify existing groundwater legislation.

To Encourage a Rate of Development Which Exceeds Current Rate

Alternative #2: Enact legislation modifying the Groundwater Management and Protection Act.

Alternative #3: Enact legislation establishing state income tax credit for irrigation equipment and development costs.