SUSTAINABLE AQUIFER LIMITS ON RURAL AND URBAN DEVELOPMENT IN NEBRASKA

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The Dakota aquifer system in Nebraska (Cretaceous)consists of sands and conglomereates, which are primarily rivers channel deposits overlain and surrounded by aquitards of shale and mudstone. Lateral lithologic changes commonly occur in less than 100 meters. Sustainable production of Dakota water may place limits on growth in Lincoln and Omaha, Nebraska's two largest and fastest growing cities with more than 50 percent of the state's population. In addition, more than 35 smaller towns and many rural areas are dependant upon the Dakota for water. An additional constraint on development of the Dakota aquifer is the occurrence of saline waters in localized areas, especially in the Lincoln area. Excessive pumping in or near these saline areas has resulted in production of water unsuitable for human consumption or agricultural use. After Lincoln's Dakota wells became saline in the 1930's, an alternative well field for Lincoln was developed more than 40 kilometers distant in the Platte River floodplain. Stratigraphic models and geophysical studies to define limits of aquifer materials and water quality in the developing urban areas and in rural areas are in progress. These studies will allow better policy decisions on sustainable development in both rural and urban areas.