

PANEL - WATER IN LAND DEVELOPMENT

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I very much appreciate the opportunity of participating in the 17th Annual New Mexico Water Conference and it is a pleasure to be on the panel with such distinguished persons as David King, Harvey Mudd, and Carter Kirk.

I would like to present my thoughts in two sections. I would like to discuss the overall availability of water within the State of New Mexico and then subsequently relate that to the land resources and the support of the population.

Water Resources of New Mexico, a document compiled by the State Engineer Office in cooperation with New Mexico Interstate Stream Commission and the U. S. Geological Survey published by the State Planning Office in 1967, indicates that, and I quote from that document: "When New Mexico has fully developed her surface-water resources within allowances of the seven interstate water-apportionment compacts to which she is a party, river inflow to the State will approximately equal river outflow; and New Mexico will use about the amount of streamflow that she produces." On the average, it is my understanding, from the same document, that little more than three million acre feet appear annually as stream runoff indicating that our total renewable water resources, excluding groundwater, amounts to three million acre feet annually.

Discounting groundwater mining for a moment, it would appear that New Mexico has three million acre feet of water to put to some use annually into perpetuity should weather conditions remain relatively constant. This amounts to 978 billion gallons annually or 2,680 million gallons per day. It is my understanding that this water resource is presently totally appropriated to beneficial use either through existing uses and projects that are authorized or are under construction. Excluding, for the moment, the finding of a fantastic groundwater resource, present water uses demand New Mexico's total water resource. Therefore, there can be no significant change in water or land use to support an increase in population without the diversion of water from an existing use. In order to put into perspective the 2,680 million gallon a day resource, I would like to develop some figures.

Present surface water resources will support:

1 million people on an	Agricultural Based Economy
8.6 million people on a	Municipal and Industrial Base at
	300 gal./capita
26.8 million people for	Municipal Use Only

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270 million people for	Restricted Household Water Use
10.7 billion people for	Drinking Water Only

Now if we add to the above resources the available groundwater, we can increase the above referenced numbers. Quoting from Water Resources in New Mexico: "Hydrologists and geologists now generally believe that most of the State's large economically usable ground waters have been located and that a future increase in groundwater usage comparable with that of the last quarter century cannot be expected." It is noted that approximately a million acre feet of groundwater was put to beneficial use in 1965. If we assume that we can sustain that usage through a reasonable period of future generations, the above tabulated figures would be increased by about 30%.

We know, of course, that the above water resources are not available equally to the land and people as presently distributed in New Mexico. The Four Corners area of the state is water rich. The Rio Grande is reasonably well-supplied with water while other portions of the State have little water available. Modern day technology, however, would allow for a transport of water resources anywhere within the state provided legal authorities were obtained and the economic bases were such to cover the cost of construction and operation of water transmission facilities.

The land area of New Mexico is approximately 79 million acres. If this land area were totally subdivided into 50 by 100 foot single family dwelling lots, there would be sufficient area for 640 million families or 2.3 billion people, considerably more than the 26.8 million that can be supported by the surface water resource for municipal water supply. There is no question that the water resource is limited in New Mexico and that land resource is sufficient. This statement is made with the understanding that should population pressures be great enough, all land could be developed for human occupancy even our beloved Pecos Wilderness, the Gila Wilderness, and our Indian Reservations.

Having looked at the overall resources, we must now decide how and where to put the resources to use. It is obvious that we can support a great many more people if our water resources are diverted from agricultural to industrial and municipal uses. I would estimate that a realistic figure would be diversion of half of the present agricultural water to municipal and industrial resources indicating that we could support approximately six million people.

Using the six million figure as a hypothesis for discussion, we can see that a great deal of land resources would have to be developed for human occupancy. How these water and land resources are used for support of economy and people will greatly influence the quality of living for future New Mexicans. There is no doubt that we can make a large number of mistakes and survive an ecological crisis for an extended period. For example, in April 1964, Mr. Larry Gordon, then Director of the Albuquerque Health Department and now Director of the New Mexico Environmental Improvement Agency, prepared a report on environmental health problems relating

to water in the Albuquerque area. At that time, hard detergents were in wide-spread use and it was noted that concentrations as high as 0.83 ppm were found in the shallow groundwater. The Drinking Water standard is set at 0.5 ppm indicating pollution above the standard. At the time of Mr. Gordon's 1964 report, it was estimated that approximately 15,000 private water supplies and sewage disposal systems were in existence in the Albuquerque Valley area. That estimated figure has now grown to 25,000 just eight years later indicating that we have not yet stemmed the tide of inappropriate land use development and growth, and no crisis has occurred.

The question of how to utilize our land and water resources will be with us, I believe, for an extended period; however, we are beginning to move in the right direction. As a result of my presentation to the New Mexico Health and Social Services Board in August 1970, Mr. Jasper, then Director of Health and Social Services Department, appointed a committee to develop some health related land use regulations. That committee was made up of environmentalists, public health personnel, land developers, State Engineers Office and Planning Office representatives. The committee worked long and hard hours for a number of months and developed a draft set of regulations relating to subdivision development. Mr. Art Trujillo, a planner for the Northern New Mexico Economic Development Administration, prepared a set of model regulations relating to public health aspects as well as other aspects of land use development, and through his diligent efforts and efforts of the Environmental Improvement Agency - Region II personnel, the Counties of Santa Fe, Taos, Mora, and San Miguel have adopted land use regulations substantially in the form prepared by the committee. Bernalillo County and several municipalities throughout the state have also developed comprehensive land use and subdivision regulations.

I believe that it is necessary to develop sufficient regulations, either at the county level on a statewide basis or at the state level covering the entire state, at this time. The main question which always crops up in the development of any such regulation is allowable lot sizes in relation to water and sewer services to be made available. Regulations which are developed cannot be considered solely on the premise of whether or not a septic system will work on a particular lot. It is my position that land development must be properly planned in consort with the resources available and the effect of the development on the quality of the resources. For example, the increase in salinity of groundwater resulting from the domestic use of water which is disposed of through leaching.

A study conducted by EIA indicates that domestic water use adds about 350 ppm of salinity. Using this figure and assuming each home has four people producing 75 gallons each, it can be shown that a non-moving groundwater aquifer of 25 feet thickness and initial concentration of 350 ppm would be polluted in 24 years if there were one house per 1/4 acre. In most instances, the groundwater is moving and it is frequently thicker than 25 feet allowing an extended period to pass before problem conditions manifest themselves. Nature can withstand considerable stress before she retaliates, however, we should not drop our guard simply because there is a storage bank for us to draw on.

I believe that Mr. George Bernard Shaw, one of my favorite authors, has stated the problem quite well in the following quotation: "Nature's way of dealing with unhealthy conditions is unfortunately not one that compels us to conduct a solvent hygiene on a cash basis. She demoralizes us with long credits and reckless over drafts, and then pulls us up cruelly with castastrophic bankruptcies. Take, for example, common domestic sanitation. A whole city generation may neglect it utterly and scandalously, if not without absolute impunity, yet without any evil consequences that anyone thinks of tracing to it. In a hospital two generations of medical students may tolerate dirt and carelessness, and then go into general practice to spread the doctrine that fresh air is a fad, and sanitation an imposture set up to make profits for plumbers. Then suddenly Nature takes her revenge. She strikes at the city with a pestilence and at the hospital with an epidemic of hospital gangrene, slaughtering right and left until the innocent young have paid for the guilty old, and the account is balanced. An then she goes to sleep again and gives another period of credit, with the same result."

I thank you for the opportunity to work with you here today.