

THE CITIZEN IN WATER AND LAND USE PLANNING

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I feel rather nostalgic about this invitation to come to New Mexico. Five years, thousands of miles of travel and the width of the State of New Mexico separate me from the circumstances under which I came to Portales in early 1967 to learn about water issues in the Southwest and to become acquainted with New Mexico League members. In 1967 I had been national water chairman for the League of Women Voters only a few months, both the League and the nation thought that the name of the problem was water supply, and a great many Americans were still happily unaware of the true nature of the environmental crisis. In fact, most Americans at that point had never heard of the words "ecology" or "environment" and even among those who had, the real problem seemed to be to have enough clean water for their needs in the right place at the right time. Within the League we were devoting our efforts to river basin planning, to deciding who should pay for a clean stream, and working to create public awareness of the national water crisis.

Now here we are in Las Cruces five years later discussing the inter-relationship of water management and land use planning on a much more sophisticated level than would have been possible at that time in the past. During this five years we have had our national attention assaulted by a continuing barrage of bad news about the nation's physical health. We know now that laws are no panacea, that the clean-up of air and water is costly, and that the problem is of immensely greater proportion than we had ever imagined.

Nevertheless there is considerable basis for optimism--in legislative commitment, citizen awareness, and technological progress. The fact that we are together at this conference to look at the effects that one kind of environmental planning or decision has on another facet of the environment is both necessary and reassuring, and I am glad to be a part of it.

One of the current quotations which has been considerably overdone, but which is nonetheless true, is the one which says that everything is related to everything else in the environment. Nowhere is this easier to prove than when we take a look at how water management and land planning are interrelated. Many of you present today are professionals in the field of water resources management--engineers, sanitarians, scientists, researchers, agency personnel, and the like. I am not. I can only tell you how the situation looks to informed laymen and what we think might be done about it.

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a level of some thirty-five thousand parts per million. This brine level is stabilized by allowing a small portion to flow to the smaller second stage, the function of which is identical as described in the first stage. This is done for energy conservation. The second stage brine is then concentrated to approximately some two hundred and fifty thousand parts per million. This results in a boiling point rise of approximately seven to eight degrees. This brine level is stabilized by allowing a 0.2 to 0.3 per cent of the initial plant feed rate to be poured to a salt pad. A footnote concerning the salts poured to the pad is that at the present time a research program is underway which would indicate that something useful can be made from the accumulated salts.

What makes this process different or unique? First, with pretreatment other than pH control (pH 5.5 to pH 7.5), we are able to exceed the saturation limitations of scale forming minerals without precipitating the scale on the heat transfer surfaces. We account for this success, first because of very low heat fluctuations and second because of Btu per square foot which would reduce the tendency to set scale on our heat transfer surfaces. Secondly we incorporate a seeding technique similar in part to work done by the Russians and funded research programs conducted here in the United States. The theory of seeding is based on the premise that as a particular mineral reaches its saturation limitations in a particular fluid, it would prefer to plate out on a nucleus of its own generic type as opposed to a foreign surface such as the metal in the heat transfer surfaces. The theory in practice is evidently valid, for we do, on initial start-up, charge the brine with seed. This has consistently allowed us to concentrate, through the various saturation zones, without precipitating any scale on the heat transfer surfaces. Once we have reached our design concentration levels, the plant is generating new seed, eliminating the need for continuous seeding.

Another feature of this plant that is of special interest is that -- due in part to the low energy levels, the vapor compressor, and an efficient feed heat exchanger -- we are able to convert a pound of waste water to a pound of pure water for an average of thirty-five BTU per pound.

The conclusions of this four year research program have resulted in a three-way partnership between Reading & Bates Offshore Drilling Company, The Boeing Company, and El Paso Natural Gas Company. Through the efforts of these companies, a subsidiary known as Resources Conservation Company has been formed. Resources Conservation Company is headquartered at the present time in Seattle, Washington.

The most obvious factor in the situation facing land use planners is that the decisions which are made on uses and sites will affect water supply and quality for years to come, perhaps forever. In the Southwest demands upon land use which involve water choices also are primarily those of land for water resource projects, land for farming and grazing, land for urban development--although there are many others as well.

In the report of the Commission on Population Growth, Population and the American Future, we are reminded that "water requirements already exceed available flow in the southwestern U.S." and that "growing population and economic activity will cause the area of water shortage to spread eastward and northward across the country in the decades ahead." This prospect gives great importance to consideration of long and short range effects of water resource projects on air and water quality. We are all aware that dams for water storage and hydroelectric sites, inter-basin transfer, straightening of channels, and large scale withdrawal of ground water are some of the more common water resource projects. Unfortunately, not enough attention has been paid to some of the possible effects of these decisions on the rest of the physical world. Impoundment of water by dams can alter water supplies for a region by reducing downstream flows, altering water tables and promoting evaporation of impounded water through increased exposure of the water surface to the atmosphere, especially in arid regions. Dams trap sediments, reducing the effective storage capacity of the impoundment. Dam sites need to be carefully surveyed for subsurface structural ability to withstand great pressures in order to avoid dam failures and damage downstream. They can block fish spawning runs.

Straightening and deepening of natural stream channels may alter water levels and velocity which in turn affects rates of erosion and sedimentation. Interbasin transfer can alter chemical hydrological environments, such as salinity, and possibly other natural patterns of vegetation, climate, etc., depending upon the scale of the project. Large scale withdrawal of ground water can cause saltwater intrusion in coastal areas or subsidence of the land depending on the geologic conditions existing in an area.

Land use for grazing livestock significantly affects the environment. If grazing locations are not carefully chosen and managed, nearby hydroelectric reservoirs can be silted up, reducing water storage and energy output. Loss of covering vegetation can also cause excessive salinity and removal of other minerals affecting regional water quality.

Use of fertilizers, pesticides, insecticides and herbicides may produce healthy food but not necessarily healthy fish and animals on adjacent lands and their use may be detrimental to overall water quality. The practice of channelization may cause increased flooding and sedimentation downstream. Use of improved irrigation and drainage techniques is important to prevent salts and plant nutrients from reducing water quality downstream.

Although water quantity is a first consideration in land use planning, water quality needs to be better appraised. Too rapid growth taxes the capacity of community treatment facilities, and industries, subdivisions, and shopping centers discharge untreated wastes into the water with serious effects on health, property, vegetation, and wildlife. Large scale development can have regional effects on water supply-- withdrawal of ground water in one state can effect the availability of ground water in another state. In arid and semi-arid areas depletion of stored ground water must be considered every time a land use decision is made. Often the effect of urban development is not fully assessed, and cities and farms compete for the same water. Higher densities and large areas of paving increase urban runoff and simultaneously inhibit ground water recharge--thereby reducing the regional water supply.

One could go on endlessly detailing the need to consider land for open space, land for transportation, land for waste disposal, land for power generation--and in the course of it show that in every demand there is a comparable commitment in terms of water usage.

This is the way things look to the general public and there is grave concern about how these conflicting demands will be adjudicated. Ever since 1965 the League of Women Voters has been the recipient of a technical training grant to conduct conferences for community leaders on land and water issues. In the course of doing this we have sponsored such projects in every section of the country in all or part of 42 states. In fact I have just come here from Cedar Rapids, Iowa, where we have one in progress this week, using the theme, "Agriculture in a Quality Environment." One of the permanent parts of these projects has been a panel of experts which presents the full range of competing demands on uses for the water of the region with due consideration for the related land effects. We have tried to assist community leaders in determining how to decide priorities and preferences for reconciling these competing demands.

How do we tell people to approach these difficult choices? We suggest to them that there are perhaps five basic ingredients which are necessary to reaching wise decisions on good planning for water resources management. We include such things as:

1. Ample information about practical alternatives
2. Evaluation of the demands which various segments of the public place on specific uses
3. An attempt to maintain flexibility for the future
4. Public involvement at every step of the planning process
5. Public discussion and understanding of plans, options, costs, and the environmental impact of the choices.

I very much doubt that there is anything in that list with which anyone here would disagree, but somehow the application of this to a concrete proposal becomes infinitely more difficult. This is especially true when we attempt to use these principles in evaluating water resource projects. It has been the strong desire of League members for many years

to have intangible values as a part of the consideration as well as to see the public presented with alternative plans. In fact, back in 1969 in testimony to the National Water Commission, we said:

"We think the time is ripe for devising new ways to evaluate water resource projects. Economic efficiency is no longer acceptable as the sole measure. The cost/benefit ratio should be only one tool. If it is retained, more value in the cost side should be assigned for benefits foregone and values lost when projects are constructed. Enhancing the nation's material wealth may be of lesser importance than fulfilling the desires of the people of the region; enriching entrepreneurs may be of less importance than preserving irreplaceable values for public enjoyment. Such value judgments must be made by citizens and not by technical experts."

Now the Water Resources Council has completed its Special Task Force Report and is proposing new principles and standards for the preparation of river basin plans and for the formulation and evaluation of federal water and related land resources projects. These were open to comment until March 31, and thus citizens and civic organizations have had a unique opportunity to join with government in shaping new rules. The League of Women Voters reviewed these proposals and submitted a statement for the record, from which I quote:

"We are glad to see inherent in the Proposed Principles and Standards for water and land resources planning a more tangible and effective route for governmental consideration of benefits other than economic efficiency and cost. Perhaps the greatest step forward in the judgmental process necessary is that of a change in the discount rate to reflect values society places on benefits and costs occurring in the future as compared with the present. We are greatly encouraged by the emphasis on broader basis and more public participation."

It seems to me that the various accounts proposed by the Water Resources Council provide a methodology for consideration of social and economic values in water resources management and that this kind of built-in examination of alternative values and costs is more meaningful than an eyeball-to-eyeball confrontation between developers and environmentalists.

Some years ago I was invited to speak to the Western Interstate Water Conference in Fort Collins, Colorado, on "Improving the Planning Process-Establishing Values," and following this conference I was invited as a representative of the League of Women Voters to become a member of the Advisory Committee for the Westwide Study, which I accepted.

Unfortunately, time, distance, and money have precluded my attendance personally at meetings of the Committee, but I have received all of the information on the Study, and have arranged for a knowledgeable League

member from the area in which the meeting is held to be my representative. I tell you this so you will know that League members are not unaware of the stake which the State of New Mexico has in the putting together of the Westwide Plan and the actions which will come after the moratorium. This has been a valuable experience to us, and I hope that, in turn, we can be a channel for public understanding and discussion of the Study and the Plan when the appropriate time comes. I am sure that many of you here have been or will be involved in one way or another with this operation also, and thus my purpose in mentioning it is to put emphasis on the need to be certain that the interrelationships of land and water decisions are a part of the reconnaissance investigations. Obviously this study will be the most comprehensive attempt yet made to gather together all of the information needed for decisions in water use in the West for decades to come. It would be extremely short sighted of us all not to make the most of this opportunity to inject into consideration the impact which land use has on water quantity and quality and vice versa.

In another western state where water problems are of urgent concern, the Director of Water Resources is quoted as saying, "Water quality and regional development are on a collision course." If this is true, and all indications are that it is, then the most important thing we need to consider at this Conference is whether, by rational planning for both land and water, development can accelerate and water quality and supply improve.

In regional planning for water resources we seek the best of all possible worlds--one where planners will resolve the inevitable conflicts between opposing interests, opposing aims, between development and non-development, between wise use and profligate tendencies, between economic necessity and idealistic philosophy. But planners neither can, nor should, make these decisions in a vacuum, neither knowing nor caring what people want. The purpose of comprehensive planning is to devise a pattern for economic and physical development, harmonious and well balanced in its use of land and water. Planners suggest corrective measures for existing problems and recommend priorities for improvement programs in order to guide growth along orderly lines. The master plan is a flexible guide for the making of all developmental decisions, public and private, but it rests on many earlier expressions of community preferences, on many choices between incompatible aspirations, on compromises and adjustments to gain necessary public support.

In recent years there has been increasing acceptance of the idea that planning and management of water and related land resources are best accomplished through some type of organization that cuts across traditional political boundaries and deals with resources in their geographic unity. To put this idea into practice has proved extraordinarily difficult. In the absence of a comprehensive plan, water management and land use programs and policies of separate jurisdictions frequently conflict to the point where plans of one are negated by action or inaction in another. Generally speaking, either a metropolitan area or a watershed would be better served by a unified plan for its water source--by

a plan that takes into account the many needs for water and provides for multiple uses. Yet there are few places where such a plan is being applied. All too often water plans are drawn by representatives of vested interests, by professional water and sewer engineers from municipalities, by industrial engineers, rather than by water resource and land use planners whose aim is to find the best utilization of the resource for the entire region.

It seems to me that the first step toward good water-land planning is to develop a truly creative regional plan; the second is to involve the people of the region; and the third is to establish some institutional arrangement, not only for making the plan, but for putting it into effect.

We hear a great deal about comprehensive plans in the present time. Indeed we in the League are very fond of this term. We use it in our statement of position where we say..."In order to meet the present and future water needs of the people of the United States, the League of Women Voters believes: comprehensive planning, development and water management on a regional basis is essential to the optimum development of the nation's water resources."

But can regional planning (and remember a region can be large or small) for water resources be comprehensive if it includes the multiple uses of water but not the general use of land? Clearly the location of industries and recreation areas will affect costs of water supply and waste disposal in cities or the stream's watershed. The effects of land use choices on water management must be evaluated. The evaluation must be given weight in location decisions of industry and in land-use planning by local, state, and regional planning agencies. Stream specialization to provide high quality recreation opportunities, for example, will be impossible without appropriate control of land use.

Any institutional machinery for comprehensive planning will need to deal with both water resources and land use controls and to influence both public and private decision-making where ever the two are interdependent. It seems to me that what we concerned citizens want in regional planning for water resources is a comprehensive plan that gives full consideration to water and related land resources of the area and involves citizens in the decision-making. We want planners to provide us laymen with the information we need to make the hard choices from which there is no turning back. We want to know ahead of time the inconveniences, the regulations, and the costs that are involved. We want to be prepared to pay the price when we commit ourselves to the final goal.

What is required is a value judgment which compares the known risks with the anticipated benefits. No scientific procedure can tell us how much irreversible damage we ought to tolerate and no scientific principle can tell us how to make the choice. The necessary judgments, therefore, are not the responsibility of scientists and technologists, or officials, alone, but of all citizens, and we are all citizens. The League of Women Voters is convinced that people need help in recognizing the pos-

sible choices for land and water use and that many people are eager for sound and solid information on which to base value judgments. Those of you in this room who so obviously have the knowledge and experience to help people choose, need to share your expertise with the public and to have the faith that in a democratic society, value judgments should be made by the public through political processes. Upon you and hundreds like you rests the responsibility for a new understanding of political maturity and judgment in which the public accepts, through a series of considered decisions, the responsibility for making its choice for the quality and quantity of the nation's water and land in this generation and along with the pragmatism and the realism on which the League of Women Voters prides itself, we recognize that we need the lift of the spirit which comes with planning for a better future. We want planners to give us this inspiration, to raise our sights. After all it was a planner who first said, "Make no little plans for they have no magic to stir men's souls." To this thought in this day and age when planning has become essential to survival, we can only say, "So be it."