

## A LOOK INTO THE FUTURE

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It is with great pleasure that I accepted the invitation from Prof. Clark to deliver the keynote address at the 18th Annual New Mexico Water Conference. The Bureau of Reclamation has had a long and rewarding program of activity in New Mexico dating back to 1905 with the Carlsbad Project. Although varying in intensity, that program has continued through today, and I am sure will continue far into the future. Of particular satisfaction in recent years has been the opportunity to make an input to your State water plan.

It is most timely that this conference is devoted to the New Mexico State Water Plan. Over the past 5 years or so there have been more penetrating, far-reaching upheavals in water-planning norms than in any like period of history. And most, if not all, of these changes call for greater State involvement in planning for the conservation, development, and management of water and related resources. This is as it should be.

Perhaps the most far-reaching development of recent years affecting planners is the changing attitude toward population growth. In the past, with demographers confidently predicting population expansion following well-tested growth rates, planners structured accordingly as they looked 20, 40, and 60 years into the future. With the growing awareness that there is a practical limit in population that a Nation's resources can support at desired standards of living, future projections may be much different from the past. State attitudes can materially affect the pattern of population growth within a State. In-migration can be encouraged or, as is now happening in some states, it can be discouraged. Your State water plan must assess this factor from the New Mexico viewpoint.

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The explosive thrusts of environmental concerns in recent years have presented new challenges and added new complexities to planning processes. But here again, you in New Mexico are the ones primarily concerned with the type of future environment that should prevail, and the State water plan should reflect your desires in this respect.

A separate part of the overall environmental picture, but encompassed in a separate set of laws, is the water quality control program. The establishment of water quality standards throughout the Nation has created one more major problem that water planners must face and resolve. Hardly any project that stores, diverts, or otherwise changes the natural flow of a river or stream is unaffected by requirements of water quality considerations, be it for fish, aesthetics, or the maintenance of set standards. The State has the responsibility to set State water quality standards, and again the State water plan should reflect State attitudes here.

Two other important factors of recent years which have a significant impact on water resources development are the rising discount rates in effect for justifying Federal water resource programs and the increasing competition from urban-oriented Federal programs for the Federal dollar. By restricting Federal water resource developments, these have the effect of placing greater responsibility on State and local interests for such activity.

The very recent, and in many ways controversial, proposed report of the National Water Commission places overwhelming emphasis on State and local responsibility for water resources development and management. The central theme of that report is to retire the Federal Government from the water resources development field and turn responsibility over to the States and local interests. While a trend in this direction is obvious, I cannot agree in total with the Commission's findings which I shall discuss briefly later.

All of these developments of the past 5 years point strongly to the need for comprehensive, well-structured State water plans. The water leaders of New Mexico are to be commended for their foresight in anticipating this need and the steps that have already been taken to develop just such a State water plan for New Mexico. I reiterate, this conference could not be more timely.

Inasmuch as it is probably the liveliest topic of conversation in the water resources field today, I would like to return to the National Water Commission.

The Commission has released and held public hearings on a review draft of a proposed report on national water policy. This draft contains 290 significant and far-reaching conclusions and recommendations. Many of the recommendations are sound, and others are proving to be quite controversial. Regardless of your personal opinion on the merits of this report, one item is very self-evident. The Commission has pointedly determined that substantial changes are needed in national water policy, and it has attempted to outline what such changes should be.

This 4-year study can have a major impact upon the organization, financing, evaluation, and management of water programs. Emphasis has been placed upon environmental considerations and greater responsibility for State and local participation in water planning and administration.

The Commission's proposal for recovery of all costs, including interest, from direct beneficiaries of water resource developments is a controversial issue, the outcome of which is uncertain. Its emphasis upon efficiency criteria for evaluation should be broadened to give greater recognition to social and environmental factors and regional and local goals. Environmental analysis needs greater precision. The Commission has made good proposals for improved management of existing water supplies. Further consideration needs to be given to the nature of Federal action programs which cannot be undertaken at the State or local level. Its recommendation for a strengthened independent Water Resources Council is not consistent with President Nixon's Executive Reorganization Proposal that envisions a Department of Natural Resources.

Many of the Commission's recommendations would require congressional legislation, and the remainder are dependent upon executive approval and State and local cooperation. The nature of these responses to the Commission's report is uncertain at the present time.

Executive reorganization and impending changes in water policy leave us with an uneasy feeling that the future may well differ from what our best guesses now lead us to expect. Water resources planning for the future is now reflected in a very cloudy crystal ball.

Extension of lines on graph paper to show what would happen if past trends should continue into the future is not enough, for the lines are changing unpredictably. There have been some indications, for example, that electric power consumption is increasing at a slower rate. It becomes necessary to envision not only one, but several sets of possible future conditions. A declining birth rate leaves us perplexed on how to evaluate the Census Bureau's high population projection of 300 million people in the United States for the year 2000, or its low projection of 250 million. The difference of 50 million people can profoundly affect future requirements for the use of water resources. Can we plan with enough flexibility to meet either condition?

The National Water Commission's report is not sufficiently flexible in this respect. It assumes, for instance, that agricultural water shortage will not be a problem to the year 2000, that consumptive water use in agriculture will decrease, and that transfer of water from agriculture to other uses will not restrict food supplies or export possibilities. The Commission therefore concludes that there is no longer any need for federally subsidized agricultural water development.

In contrast with these findings, the Commission's report, as a whole, implies that water policies of the past have not proved to be sufficiently flexible to meet changing needs. We must insure that future policies do not prove to be equally inflexible in the face of further changes in needs and conditions not now foreseeable.

The trend toward decentralization of Federal Government, greater emphasis on local and State governments, revenue sharing, and increased non-Federal cost sharing is unmistakable. However, this does not signal the end of Federal involvement in the natural resource field. In my opinion, there will continue to be a need for a strong Federal role. However, recent pronouncements forecast a realignment in the level of participation among the various levels of Government--Federal, State, and local. The appropriate levels of this participation is the type of national policy that I feel this Nation should be articulating. It isn't what level of Government should predominate in the natural resource field--but rather what should be this relationship--with the knowledge that it will vary from area to area and function to function. However, let's be candid and recognize that up to the present time this partnership has weighed heavily on the Federal side.

There are two aspects of the National Water Commission report with which I particularly agree and which can have significant effect upon future water development. The Commission urges that institutions such as State water laws and interstate water compacts be reexamined and amended in light of current conditions and priorities. Granted that amendment of basic State water law is a long, agonizing experience, it is becoming more necessary each year. I doubt that there is a single State that could not profit immeasurably by updating its State water codes. Similarly, interstate water compacts negotiated decades ago and considered by many as sacrosanct often do not reflect current needs and priorities. For example, past compacts have, in most cases, allocated all of the water in a given basin among the participating States. In so doing, the problems of water quality were not recognized, and the user receiving the last drop of water at the end of the line is faced with receiving water of unusable or questionable quality. I doubt that today an interstate water compact would be approved if it did not provide sufficient outflow to assure the user at the bottom of the totem pole a quality of water he could effectively use.

The other aspect of the Commission report is that bearing on greater financial input by local and State sources to water resources development. Although I do not advocate going as far as the Commission does, the trend in this direction is unmistakable. It is time that water leaders at the local, State, and Federal level pool their thoughts and come up with new imaginative and innovative ways of financing desirable programs so that such programs can effectively move forward.

In the remaining time I have left, I would like to outline some of the evolving changes the Bureau of Reclamation is undergoing. Such changes are not new to our agency; however, the rate of change has increased in recent months because of the rapidly changing values and priorities of our Nation. I am confident that many of the new things we are doing will find application in planning future water resource programs in New Mexico.

I would like to note first though, that when those of us in an agency such as the Bureau of Reclamation advocate change in programs,

we are not discrediting the past. The accomplishments of such agencies speak for themselves. However, we must recognize that such accomplishments were undertaken in recognition of priorities and values of that day--that is the principal reason they were so successful. Now we must similarly address our program to today's priorities and values and anticipate the future.

It is obvious that the automation of today signifies a different world from the clockwork mechanisms of our grandfathers. More subtle and basic aspects of our life are also changing --public goals, values, and styles of life focus on "how good" rather than "how much"--on quality as well as on quantity. As a result, we must now consider many subjects once thought to be outside of the Bureau's scope. A broader needs-oriented approach, covering social and environmental factors, has been added to the traditional resource-oriented viewpoint. The planning process considers alternative goals as well as alternative means. Multiple uses and multiple objectives require input from many professional specialities and from the public at large.

Multiobjective planning as outlined in recently adopted Bureau planning guidelines is fully responsive to these new thrusts, including the requirements of the 1969 National Environmental Policy Act. This Act specifies alternative planning and the utilization of interdisciplinary planning teams. This planning concept requires highly trained, interdisciplinary teams, which has necessitated the centralization of much of our planning capability in the regional offices. Regional Director Jim Bradley has recently announced such a planning reorganization of the Southwest Region. We will be centralizing most of our planning capability in Amarillo, Texas. However, we will be maintaining State liaison offices in such locations as Albuquerque.

I would stress that I see this program as strengthening our ability to assist your State in land and water programs. We will be maintaining a State visibility and, at the same time, have highly trained teams available to assist you as appropriate.

The planning program of our agency is being redirected to give priority to meeting the near-term needs of people. Of the six new planning starts included in the F.Y. 1974 recommended budget, five emphasize municipal and industrial water supply. Over 85 percent of the envisioned costs of constructing these projects is for the M & I function. One of these new M & I starts is a water supply study for Gallup, New Mexico.

A new category of planning investigation is that of total water management. The principal objective of these studies is to improve the management and utilization of existing supplies. We have two such studies in our program at this time; one is the Elephant Butte-Ft. Quitman investigation. This study encompasses the Rio Grande Valley between the upper end of the Elephant Butte Reservoir in New Mexico and Ft. Quitman in Texas and the surrounding region in southern New Mexico and far west Texas. As you know, all of the surface water of the area has been committed, and the ground water for municipal use is being withdrawn faster than it is being replenished.

Because of the phreatophyte growth and drought conditions, the water yield to the Elephant Butte Reservoir in recent years has been 65 percent of the long-term average inflow. This has caused economic problems in the project area. Input into the broader aspects of this study is coming from business and agricultural leaders, State water agencies in Texas and New Mexico, State universities, irrigation districts, and other local agencies. We are most pleased with the cooperation and input into this study to date. We are confident this program will evolve a plan for orderly, rational, long-term development of available material and human resources to achieve a regional economic potential within a setting of the highest quality environment.

In the short time I have with you today, I cannot cover all of the interesting and exciting activities we have underway in the Bureau. Two in particular have potential for extensive long-range beneficial contributions to New Mexico's future. One is Project Skywater, our weather modification program with which many of you are familiar. The technical problems of inducing precipitation in mountainous areas are well along to solution, and our experts are confident that increases in annual precipitation of 15-20 percent at cost of water yield in the range of \$1-1/2 to \$2 per acre-foot are virtually assured. The more difficult problems in weather modification may well be in the realms of environmental, ecological, and legal considerations. These problems are under study but we are not prepared at this time to forecast when they will be resolved.

The other potential is in our program to explore the feasibility of desalting geothermal brines in the Imperial Valley of California as a source of augmentation for the Colorado River. Our program is moving along with a production well now in operation and assembly of a pilot-plant desalter in process. It will still be several years before we have concrete results.

Other new programs include the Colorado River Water Quality Improvement Program; water quality studies on the Salton Sea in California and Lake Meredith in Texas; and water supply studies associated with increasing energy demands.

Our program is not without problems or conflicts, as evidenced by recent district court action on Lake Powell. There is increasing demand for releases from Reclamation reservoirs for such in-stream uses as fish and wildlife, recreation, and aesthetics.

Presently our Bureau has a \$6.2 billion backlog of authorized, but unconstructed, projects. Based on present level of construction appropriations and a very modest level of increasing costs from inflation, elimination of this backlog will extend beyond the end of this century. Such a time frame would not be compatible with needs or the authorization of new priority projects. A review of this backlog is being undertaken by the Bureau and the Department to attempt to bring the backlog into more manageable form.

From this brief review of recent activity, it is clear that many new forces have entered the picture to alter the programs of Reclamation. In response to changing needs, we find changing objectives and shifts in priorities among project purposes. Our way of doing business will also change as new management concepts and modernized techniques are applied.

Not only will we stress water priorities differently among project uses, but we may well urge that, in some cases, water be reallocated from one use to another. Possibilities for fuller use and reuse of existing water supplies will receive close scrutiny. Increased emphasis will be given to nonstructural components of resource management.

In economic analysis, higher interest rates will alter optimum plans through different combinations of investment and operating cost. Desalting opportunities must be compared with large diversion proposals. Economies of development by stages will be compared with full initial development. The economic aspects of new technologies will need to be explored.

We have been undertaking special studies on improved irrigation water management. We have found that by merely assisting farmers with information as to when and to what degree to irrigate, we can increase irrigation efficiencies from about 40 percent to about 55 percent. On 8 million acres of lands served by our agency, this 15 percent amounts to a saving in water diversions of about 9 million acre-feet of water annually.

However, to achieve these savings we need cooperation of the water users and State governments. Many water users have grown accustomed to inexpensive water in copious amounts. It is the cheapest tool in their production kit. Poor water management may be less costly than the labor, equipment, or improvements to achieve the water savings. Existing State water laws can be a constraint in achieving needed improvements.

New relationships of Federal, State, and local organizations must be explored. States must develop plans and establish priorities for the conservation, development, and utilization of their water resources. Federal agencies must look to the States for such guidance on natural resource programs that are limited to State significance. Rising cost indexes for construction not only require greater benefits for justification, but also greater repayment obligations. As the States become more active in water planning, it becomes appropriate to inquire whether they can assume an appropriate part of the repayable cost. With broader objectives, we need a broader base for project financing. We also need new and innovative approaches to build new institutional arrangements and revisions in water law.

Water planning and development are long-term undertakings. Presently, we have planning reports in varying stages of completion that were initiated in days of other values. We could compare ourselves to a new car dealer when the new models come out. Many of our reports are "in" with the new styles; whereas, some are not and will have to be restyled or reformulated, and we have a few Edsels or Kaisers around that will be dropped from the "line."

Water planning today is at a crossroads, barely holding its own in the competition for national attention and funds. Repeated attempts over the years to develop a sound national water policy are still unfinished. Progress has been made in broadening our objectives, but means of implementing them are still embryonic. Not even a start has been made in authorizing correspondingly broader methods of financing. Appropriate levels of investment need to be determined. Rational means of establishing program priorities need to be selected.

The running battle between well-considered rational planning and emotional reactions to crises continues at an intensified pace. So much the more do we need well-conceived, clearly defined standards and procedures. So much greater is the need for alternative plans supported by objective data. So much more pressing is the need for institutional reorganization, such as the proposed Department of Natural Resources and new relationships with State and local organizations. So much more important is the need for public water planning agencies to represent a well-considered concept of the public interest in the broadest sense.

I am confident that the New Mexico State Water Plan, which will be explained and discussed in detail during the next two days, already reflects many of these new priorities and thrusts. I am even more confident that eventually it will accommodate them all.