COPING WITH FEDERAL WATER POLICY CHANGES

PROCEEDINGS OF THE

NEW MEXICO WATER RESOURCES RESEARCH INSTITUTE SYMPOSIUM

Albuquerque Convention Center

Albuquerque, New Mexico

November 10, 1982

New Mexico Water Resources Research Institute

New Mexico State University

Las Cruces, New Mexico

PREFACE

A new federal administration always brands its special philosophy on Washington. Sometimes that philosophical stamp is so strong that it makes an impression on every state house in the nation. The Reagan administration's "New Federalism" is such a philosophy. When the administration dismantled the Office of Water Research and Technology and shifted financial burden for water projects and water research to the states, many states were unprepared for their new responsibilities.

New Mexico is not one of those states. However, questions raised at the 1982 Annual New Mexico Water Conference about the new federal policies made the need for a symposium evident. The aim of the symposium was to bring together a mix of participants to examine ways the state can respond to new federal policies.

The symposium, entitled "Coping with Federal Water Policy Changes", began with talks by federal officials on the status of several water policies and projects. Then state officials spoke about the state's role in these policy decisions. Governor-elect Toney Anaya, a little more than a week after his election, spoke to the participants about his agenda for managing New Mexico's water resources.

In the afternoon, symposium participants attended their choice of three workshops where they had the opportunity to produce a series of alternatives for dealing with federal policies. Then they met in a combined session to assess the consequences of the alternatives drawn up at the workshops.

More than 130 high school students also participated in the symposium as part of a Contemporary Issues in Science program sponsored by the Albuquerque Public School District. Their research papers, the result of a year-long study on water, will be presented at a student-run forum in April. Two of those papers are printed in these proceedings.

The success of the symposium could be counted in the record attendance, but the real value of the symposium will be in the decisions made and the actions taken by the participants themselves. Special thanks should go to the Water Conference Advisory Committee for realizing the need for this forum and taking an active role in supporting it.

George A. O'Connor

George A. O'Connor
Acting Director

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Albert Utton

PROGRAM

Coping with Federal Water Policy Changes

Albuquerque Convention Center
Albuquerque, New Mexico
November 10, 1982

	Morning Session Coping with Federal Water Policy Changes
8:00 - 9:00	REGISTRATION--Picuris/Sandia Room Message Center, bottom floor
9:00 - 9:15	WELCOME George O'Connor, Acting Director New Mexico Water Resources Research Institute
9:15 - 9:35	NEW DIRECTIONS IN WATER POLICY FROM A FEDERAL PERSPECTIVE Tom Bahr, Director Office of Water Policy
9:35 - 9:45	QUESTIONS
9:45 - 10:05	THE LEGISLATIVE REALITY OF A NATIONAL WATER POLICY Jim Hughes Legislative Assistant to Senator Pete Domenici
10:05 - 10:15	QUESTIONS
10:15 - 10:35	WATER BREAK
10:35 - 10:55	NEW MEXICO AND FEDERAL WATER POLICY Steve Reynolds, New Mexico State Engineer
10:55 - 11:05	QUESTIONS
11:05 - 11:25	STATE WATER POLICY: CHANGE OR STATUS QUO? Hoyt Pattison, Representative New Mexico Legislature
11:25 - 11:35	QUESTIONS
11:45	LUNCH Convention Center Ballroom A, third floor
	WATER MANAGEMENT Toney Anaya, Governor-elect

Workshops
Working Out Solutions

1:00 - 2:30 THE NEW FEDERALISM IN WATER RESOURCES PLANNING
Jim Daniel, District Chief
U.S. Geological Survey
Navajo Room, ground floor

CLOSING THE FEDERAL GAP IN WATER RESOURCES PLANNING
Tim DeYoung, Assistant Professor of Public Administration
University of New Mexico
Tesuque Room, ground floor

WATER RIGHTS
Fred Allen, Director of Technical Services
State Engineer Office
Isleta/Jemez Room, ground floor

2:30 - 3:00 WATER BREAK

General Session
Presenting Alternatives

MODERATOR: Albert Utton, Professor of Law
University of New Mexico
Picuris/Sandia Room

3:00 - 3:15 NEW FEDERALISM IN WATER RESOURCES PLANNING

3:15 - 3:30 CLOSING THE FEDERAL GAP IN WATER RESOURCES PLANNING

3:30 - 3:45 WATER RIGHTS

3:45 - 4:45 DISCUSSION OF ALTERNATIVES

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MEET THE SPEAKERS

George O'Connor is acting director of the New Mexico Water Resources Research Institute. O'Connor, an agronomist at New Mexico State University, received the Distinguished Research Award from NMSU's College of Agriculture in 1981. He also has administrative responsibility for a multimillion dollar, interdisciplinary research study on the uses of irradiated sewage sludge. He holds degrees from the University of Massachusetts and Colorado State University.

Tom Bahr is director of the Office of Water Policy in the Interior Department. The office was recently established to address water issues related to Interior Department responsibilities. While serving in Washington, he is on leave from the New Mexico Water Resources Research Institute where he has been the director since 1978. Before coming to New Mexico he was director of the Institute of Water Research at Michigan State University. He holds degrees from Michigan State University and the University of Idaho.

Jim Hughes is a legislative aide to Sen. Pete Domenici. He serves as the senator's staff representative to the U.S. Department of Agriculture and to the Interior Department on natural resources and agricultural issues. From 1974 to 1981, Hughes was the information director for the New Mexico Farm and Livestock Bureau and editorial director of the New Mexico Farm and Ranch magazine. He holds a journalism degree from New Mexico State University.

Steve Reynolds is the New Mexico State Engineer. He holds several state offices including secretary of the New Mexico Interstate Stream Commission, New Mexico commissioner of the Rio Grande Compact Commission, and New Mexico administrator of the Water Resource Planning Program. He is a member of some 17 advisory committees mostly dealing with water issues. He holds a bachelor's degree in mechanical engineering from the University of New Mexico.

Hoyt Pattison is a 20-year member of the New Mexico state Legislature representing the sixty-third district. He is the House minority floor leader. He is a member of several agricultural related organizations including the advisory committee for the Plains Branch Agricultural Experiment Station and the board for Water Incorporated. He is a New Mexico State University graduate.

Toney Anaya, New Mexico's governor-elect, is a native of Moriarty, N.M. He left the state at 17 to attend school in Washington, D.C. He received a bachelor's degree in economics and political science from Georgetown University and a Juris Doctorate from American University. While attending college, he worked for Sen. Dennis Chavez and Sen. Joseph Montoya. He also worked as an executive assistant to the Assistant Secretary of State. When he returned to New Mexico, he worked as the administrative assistant to Gov. Bruce King. He served as New Mexico's attorney general from 1975 to 1978.

Jim Daniel is the U.S. Geological Survey's top water resources official in New Mexico. He directs the survey's $4.3 million annual water investigation and data collection program in the state. Before coming to New Mexico in 1979, he was regional ground water specialist for the Southeastern Region. Daniel, a 24-year USGS veteran, holds a bachelor's degree in civil engineering from California State University at Sacramento.

Tim DeYoung is assistant professor of public administration at the University of New Mexico. In 1971 he served as a Peace Corps volunteer in Nepal where he designed and supervised the construction of rural water supply systems. He earned his Ph.D. in public administration from Claremont Graduate School. While at Claremont, he presented testimony on the Westlands Water District Senate hearing on federal reclamation policies, including the controversial 160-acre limitation.

Fred Allen graduated from the University of New Mexico in 1950 with a B.S. degree in civil engineering. From 1950 to 1954, he held engineering

positions with the Department of the Army and the Department of the Interior. In 1954, he joined the staff of the New Mexico State Engineer and has served that office as project engineer; chief, hydrographic survey section; and in his present capacity as chief of the technical division. The technical division is charged with providing the State Engineer the technical support for the administration of the state's surface and underground waters. This support includes collecting necessary data for the adjudication of water rights by the courts, determining the volume of ground water in storage and the effects of water right transfers on existing rights, and cooperating with federal agencies in water resource investigations.

Al Utton is professor of law at the University of New Mexico Law School. Utton is coeditor or author of several books on natural resources including Water Resources Management in a Changing World, International Environmental Law and Water and Water Rights: International Water Law. The Aztec, N.M., native holds a bachelor's degree from the University of New Mexico and law degrees from Oxford University, England.

NEW DIRECTIONS IN WATER POLICY FROM A FEDERAL PERSPECTIVE

Thomas G. Bahr
Director, Office of Water Policy

Let me start out by welcoming all of the students. I'm glad to see such a large turnout. George, you used a lot of imagination to get this room filled and you're to be congratulated.

I would like to begin by telling you something about the new Office of Water Policy in the Department of the Interior. The office was set up about a year ago by the secretary of the Interior. We are responsible for coordinating water policy issues within the Department of the Interior and its jurisdiction is limited to the department. We're perhaps the smallest office in the Interior Department with a staff of about 25 people who are divided into two divisions. The first is our State Liaison Division which is charged with searching out concerns of the states and bringing these concerns back to our office for further study. The second is the Policy Analysis Division which identifies and critically assesses policy options on a wide range of water resources issues.

When one thinks of water programs in the Department of the Interior, you generally think of the Bureau of Reclamation or the U.S. Geological Survey. Those, however, are just two of six bureaus in the department. The others which deal with water are the National Park Service, the U.S. Fish and Wildlife Service, the Bureau of Indian Affairs, and the Bureau of Land Management. In many cases, water policy evolves separately within these bureaus and sometimes policies are not consistent. Thus, our office is charged with coordinating water policy as it evolves through the various bureaus; specifically those water policy issues that transcend the jurisdiction of a particular bureau or office. When you get right down to it, there are very few water issues solely within the jurisdiction of a single bureau or office in the Interior Department. For that matter, there are very few water policy issues that reside solely within the department. Thus, I would hope you can see that the job I have is quite challenging. I have learned very quickly that the

decisions made in Washington are not always decisions arrived at through logic and reason, but rather are decisions arrived through a host of other means. Believe me, it's not academia.

Let me get into some water policy issues we are currently faced with and share with you statements of water policy that represent this administration's views. Two or three weeks ago, the secretary of the Interior Department gave a speech in Salt Lake City before the National Water Resources Association. In that speech he outlined for the first time, the underlying premise of the water policy and the direction this administration will be taking. Pat O'Meara, the executive director of the National Water Resources Association illustrated the problems of writing water policy when he said, "If you bind water policy into a book, and put a ribbon around it, the water is going to seep out through the pages and you won't have anything left when you're done." I think he was quite accurate. Water policy is dynamic; it has to reflect the will of the Congress, the responsibilities given to the administration and the concerns and jurisdiction of the states.

The cornerstone of this administration's water policy is the recognition of the states' right to quantify, allocate and manage their own water resources. It is our policy to recognize state primacy in water resources and to abide by state law and state procedure in all aspects of water management, unless specifically and expressly directed to the contrary by Congress.

In my opinion, the previous administration, and many of its philosophical colleagues who are still in Washington, didn't understand water. They didn't understand the West in particular. And, they didn't begin to understand the crucial importance of water to the West. In no case was their lack of sensitivity to the West more clear than when they issued a solicitor's opinion (the solicitor is the chief lawyer within the Department of the Interior) which addressed the subject of nonreserved water rights. In essence, this decision gave the federal government a license to take as much unappropriated water as it wanted for use on federal lands without regard to state law. Last year, the solicitor in our department, Bill Coldiron, issued the correct solicitor's opinion which basically stated that there is no such thing as a federal nonreserved

water right. We agree with that. Recently, the Justice Department issued a similar opinion on that subject and expanded on Solicitor Coldiron's findings. We're studying that now to see how it applies to the Interior Department. As far as I'm concerned, the matter has been put to rest.

Another very sensitive and important issue is that of Indian water claims. We've taken positive steps in the department to encourage negotiated settlements. Negotiated settlements are a way to bring a quicker end to what has been paralyzing uncertainty to both Indians and non-Indians alike. Right now, there are approximately 50 court cases relating to Indian water rights with legal costs averaging about $3 million each. It's a very expensive process. We believe it is better to settle claims through negotiation rather than through the courts.

Another aspect of water rights is federal reserved water rights which represent an area of continuing concern to the states. We hear increasing appeals to our office and others in the federal government for quantification of federal reserved water rights. Last month, for example, the Western Conference of the Council of State Governments passed a resolution that would urge legislation requiring quantification of all federal reserved water rights by 1990. Currently, neither the Interior Department nor the administration has any program to quantify federal reserved rights except for those instances where these claims are filed in federal or state adjudications. We're not ignoring these appeals. However, if we had a uniform policy for quantifying these federal reserved water rights, we would be ignoring the rich diversity that exists among states. We've decided that the more appropriate way is to ask the states if they want the federal government to quantify reserved water rights. If the states make these requests of the federal government, the Interior Department will do its best to respond. These requests could take the form of legislative resolutions endorsed by governors, of court requests, or in many instances of requests by officials authorized to act on behalf of the states.

Regulatory reform is another water policy item that has been troublesome. States often have asserted that federal rules and regulations have conflicted with or contradicted the states' rights to allocate and manage

their water resources. It is the administration's policy to tailor federal rules and regulations to recognize the unique character of state law. Now, of course, there's a body of federal law, created by elected representatives from all states, which has to be respected. However, the spirit of these laws is often clouded by burdensome regulations which, in many cases, have been designed more for the convenience of the federal establishment than to assist the states in complying with the intent of these laws. All too often, state governments and the private sector have been led into a quagmire of bureaucratic rules and regulations. Even though individuals are trying to make an honest attempt to comply with the spirit of the law, they simply can't do it.

We've taken an important step in the department to examine all rules, regulations and operating procedures to see if, in practice, the conduct of the department is consistent with its policy of being a good neighbor to the states. The secretary of the Interior Department has asked our office to look at all the manuals, all the written material, and all instructions to the field to see if they are consistent with that policy. We've already taken a look at the Bureau of Land Management Water Rights Manual. The manual had been several years in development and we found several instances where old policies lingered and where new policy direction recognizing state primacy was not explicitly mentioned. This manual is being modified to better incorporate policy guidance for the people in the field who will be carrying out this program.

The old "Principles and Standards" for water project planning were some of the more onerous federal rules and regulations that essentially "ham-strung" development of water projects. Water problems and solutions obviously differ among states just as climate, topography, economics, politics and population differ. You simply cannot have uniform standards that will apply to such a richly diverse setting. The old "Principles and Standards" assumed that conditions were uniform when, in fact, they weren't. We have worked on a new set of "Principles and Guidelines" which the secretary recommended to the president last month. The new set will offer planners more flexibility and discretionary decision-making authority to tailor water projects to the special needs and conditions of

the states while exercising good environmental judgment and good project evaluation.

Another significant accomplishment for the administration in water policy development was the signing of the new Reclamation Reform Act. The signing of that act culminates a constructive bipartisan effort to change and to modernize an 80-year-old law. The new law essentially increases the acreage limitation and redefines a number of requirements for project water delivery to farm operations. For the first time, the law acknowledges the realities of modern farming and legalizes commercial family farm ventures. Although the legislation has been passed, many administrative details need to be worked out by the Bureau of Reclamation which has those administrative responsibilities. The commissioner of the Bureau of Reclamation already has begun a series of field hearings around the country to hear the concerns of various irrigation districts on how to implement the spirit of that piece of legislation.

Recognition of state water rights and regulatory reform also set the stage for much needed water resources development. It is the administration's policy that water resources development be a shared responsibility featuring new partnerships between states and the nonfederal sector. The federal role in water resources development, while not clearly defined, must reflect the national strategic nature of this valuable resource. Accordingly, it is our policy that the states are in charge of water resources. Hence, development strategies must reflect the states' leadership status. Communities, agriculture and industries are the direct beneficiaries of development, so they too must be recognized and accommodated in any water development program. These partnerships will be unique. They will reflect commitments to the past, opportunities that are at hand and problems that have to be solved. The conditions of each of these partnerships cannot be spelled out in detail because of their diversity.

The administration has a no cost sharing policy at this time. However, I do anticipate the following: I think the administration is going to design some type of comprehensive cost sharing policy which will take the shape of general guidelines for federal participation in water projects. Although I don't know when a cost sharing announcement will be

made, I do expect that all the water resources development agencies will be required to adhere to the guidelines. I think the guidelines also are going to reflect the need for continued federal investment in certain types of activities such as market structures effectively used to recover the costs of certain water resources developments.

When cost sharing guidelines are agreed upon, the hard work begins in deciding how to implement such a policy. Policy implementation will have to recognize the different financial capabilities that exist in different states. Implementing a sound policy will obviously require recognition of existing law and congressional directives would have to be honored. Many issues on cost sharing remain to be resolved. However, let me say that the administration is going to work closely with the states before implementing any cost sharing policies.

Water conservation is another important aspect of water resources development. This administration believes that impounding water for release when and where it is needed is, in itself, conservation. The Bureau of Reclamation has had a long history of promoting water conservation through its water contracts and technical assistance programs. In our view, the best way to conserve water is to let the marketplace work. I believe we need to work together to create an atmosphere where water transfers can occur between a willing buyer and a willing seller. Water banking, water brokering and water leasing are some of the options that have to be looked into. Until you have a situation where the price of water reflects its true scarcity, you'll never achieve a meaningful, long-term program of water conservation.

Research is also a key element in water policy. All of us recognize that our ability to harness and manage this country's water resources has to be underpinned by a solid research foundation. Our advanced technology and scientific know-how are the most coveted commodities we have in the world today. We can't afford to compromise that position by abandoning our investment in necessary research. However, we need new partners who are willing to advise us on research needs and who are willing to help us finance research. We will have to depend on the states and the private sector to commit more of their own resources to generate new knowledge.

Our office also is taking an in-depth look at all the research programs in the Department of the Interior to find out if they're consistent with the mission of the department. We are especially looking at how the programs mesh with the capabilities of each state's research community. This has never been done. Over the years, I've been a critic of the ad hoc nature of research at the federal level. Now I'm paying penance for criticizing the federal bureaucracy by having to live in Washington.

I'd like to turn now to some items of interest here in New Mexico. I'm sure you're familiar with the Animas/La Plata project. It is still under serious consideration and apparently will not need any further authorization from Congress. The biggest problem is that the Bureau of Reclamation has been unable to get enough congressional appropriations to go ahead with such an expensive project. The proposed dam on the Gila River is not a dead issue. Garrey Carruthers has asked that the planning for that particular project be speeded up significantly. Plans for the Brantley Dam in the eastern part of the state are still on track.

Another item of special interest to New Mexico is the Sporhase decision. This was the Supreme Court ruling about the conflict concerning pumping ground water from Nebraska to irrigate lands in Colorado. Nebraska law prohibits ground water transfers to states that don't have a reciprocal agreement. The Supreme Court held that the law was unconstitutional because it was an undue burden on interstate commerce. What concerns me about the decision is the gratuitous language that suggests that the federal government might be justified in exercising increased jurisdiction over ground water resources. I would like to read from testimony I recently gave before Senator Abnor's comittee in reference to the Sporhase decision. The excerpts pinpoint the Interior Department's position on the decision:

> While some may view the Sporhase decision as an opening or pretext for an expanded federal presence in ground water management, we reject such counsel and will vigorously oppose efforts to intrude federal authority into an area that should continue reserved to the states.
>
> It's the department's view that the impact of Sporhase on the federal government is extremely limited. If Congress fails to legislate, then the status quo in the West should remain.

> Only the Nebraska reciprocity statute is immediately affected. No new powers are given to the federal government nor will they be without explicit new federal legislation preempting state regulation. Thus, the decision on Sporhase does not establish a precedent for the Department of the Interior or other federal agencies to interfere with or preempt the states' control of their ground water resources.

Again, this administration is strongly opposed to any legislative efforts designed to preempt state laws. I will close by adding that the Justice Department, in essence, concurred with our conclusions.

THE LEGISLATIVE REALITY OF A NATIONAL WATER POLICY

Jim Hughes
Legislative Assistant to Senator Pete Domenici

First, I would like to point out that these remarks were prepared previous to the events of last week. I don't think anybody has had the time to really assess the election results as they relate to the general theme of this symposium. But, to be perfectly candid, I doubt very much the elections will change where we are headed any more than the results tell us where we have been. "The Legislative Reality of a National Water Policy" is the topic of my discussion today. When George O'Connor first asked me to take part in this symposium, I thought the topic would be a snap for a hot-shot legislative aide to Pete Domenici. However, when I started to organize these remarks by asking the simple question, "What is our current national water policy?" I knew immediately that I was in big trouble. All of a sudden I was running all over Capitol Hill looking for anything I could find on water. So much for me being a hot-shot, or even thinking I knew much about water.

Getting back to my topic, the words "a national water policy" remind me of my days in the Army. When I was asked what my unit was, I would reply, "I'm in Military Intelligence." Some people would immediately giggle and ask if that was not a contradiction in terms. Perhaps that is also the case when we discuss the topic of a national water policy.

But, in trying to talk about the legislative reality of a national water policy, I've divided the discussion into five sections which, because I am, and always will be, a frustrated journalist by trade, I will call "The Issues", "The Players", "The Politics", "The Reality", and finally, "The Results".

The Issues

The issues we face today in the area of water obviously could fill a book. I will not be pretentious and say you have to agree with the short list I'm going to advance. I think that, generally speaking, we have been talking about many of these issues for years in one form or another.

At any rate, here's a list I would put forth for consideration:

1. What can government do to meet our nation's water needs and make the best use of our existing water resources?
2. Are water projects being developed and repaired in the most economical and efficient manner?
3. Are current cost allocations, repayment and financing policies for federal water projects meeting today's requirements?
4. Do our water resource projects operate efficiently, effectively and economically?
5. How will the drive for energy self-sufficiency impact on our water needs?
6. What portion of our federal budget will be allocated to water?
7. How much cost recovery from water users is possible today?
8. What impact will major water shortages throughout our nation have on our legislative system?
9. How can the nation's navigation system be developed, operated, maintained and managed in a more effective economic and efficient way?
10. What is the future role of water conservation in this nation?
11. Can the current federal organizational structure address these issues in a responsible fashion, and do our laws need some streamlining to eliminate built-in conflicts of the purposes of these laws?
12. Can we come up with a policy that will ensure that water is available to satisfy all competing uses?

Those are, as I said, just my list of 12 issues in no particular order. You can add some, remove some, and your list will probably be as good as mine. But, I think you would agree with me that many of those questions have been around for many years.

The Players

The area that is the easiest to talk about is the section I refer to as "The Players". I will start off by talking about the committees and subcommittees in Congress that have water-related responsibilities.

According to the Government Accounting Office (GAO), there are four major committees in the Senate--Appropriations, Budget, Energy and Natural Resources, and Environment and Public Works--which deal with water issues. On those committees, we can find seven subcommittees whose responsibilities include water resources. I would be tempted to add the Senate Agriculture Committee to the GAO list.

In the House, there are a total of eight committees dealing with water and 11 subcommittees, according to GAO.

Continuing in this vein, we are talking about 13 separate committee chairmen and 19 subcommittee chairmen and countless individual committee members.

From the administration, we can add the secretaries of the Interior, Agriculture and Army; the administrator of the Environmental Protection Agency and, indirectly, the Commerce and Transportation departments.

Here in New Mexico, we can add city and county officials, state office holders, state legislators, members of local reclamation district boards, soil conservation boards, state water commission members and members of Indian tribes and pueblos as some of those who become players in the legislative arena of water policy.

To those that we have already named, we can add such special interest groups as industry, environmentalists, recreationists, user groups, so-called public interest groups, and perhaps, finally, that mass of humanity called the general public.

I might add that during the late 1970s, we saw the appearance of a new force among the players which we refer to in Congress as the caucus phenomenon. We have the Copper Caucus, the Arts Caucus, the Midwest-New England Caucus, and of course, a Western Caucus.

Needless to say, life is becoming much more complicated in our nation's capitol. I know many of you out there could add many "players" to my list and perhaps the most important one, which I will talk more about later, is our judicial system.

The Politics

Now that we've got the issues down and we know who the players are, we can move on to the politics of water policy.

Back in the good old days when life was so much simpler, such was also the case with the politics where water was concerned. "Water," as an issue, was a western issue that revolved around the questions of irrigation and hydroelectric power. This may have not been the complete story, but it was the perception. East of the 100th meridian, the "water" issue really meant flood control. Again, I would say that this was the perception, and I would argue strongly that in all things involving politics, the perception is always the key.

So, what are the political perceptions on water today?

The first and greatest perception is the most obvious. "Western water projects are the worst examples of pork barrel." Never mind the fact that the federal government has spent close to $10 billion on a mass transit system for the Washington, D.C., area which has some of the highest per capita income figures in our nation. And, I would add, that very few eastern water projects are considered "pork."

The second perception that plays an important role in water politics today is the so-called sunbelt versus the snowbelt concept. The basic premise is that snowbelt states are suffering a negative federal dollar cash flow while sunbelt states, including the Rocky Mountain states, receive an unfair positive cash flow.

The third perception put forth by many is somewhat more complicated and revolves around the issue that some uses of water, or benefits from water projects, are somehow blessed by a special public good and thereby should be completely financed by federal funds while other project beneficiaries should fully reimburse the federal government.

Another perception is that certain areas of water policy are untouchable and Congress should stay away from them for fear of opening up a "Pandora's box." The question of "water rights" falls in this area.

Although there are many other perceptions on this issue, the final one I will advance is the idea that somehow in Congress we are faced with a choice between a "bricks and mortar" water program versus programs that feed and clothe disadvantaged people.

None of these perceptions has been any great secret and I'm sure many here today could make their own list of what I call perceptions that, in essence, make up the political playing field that we are forced to operate on today.

In an attempt to remain a good friend of both Steve Reynolds and Tom Bahr, I have purposely tried to avoid talking about the perception that "a national water policy should be developed through close consultation and cooperation between the administration, the Congress and the states." Having advanced that profound notion, I will now move on to the fourth section.

The Reality

By blending in the issues, the players, the politics and adding one final element--our judicial system--we can now focus on what I call the legislative reality of national water policy.

I think a good argument could be made that today we do not have a well-coordinated, goal-oriented federal water policy. I would add that there might be some who would state that we have never had such a policy. And further, they might say that given the dimensions of this beast called a "federal water policy" as described by somebody named Hughes, a well-coordinated and conceived federal water policy cannot be achieved. Perhaps that is the case. Perhaps it depends on whether or not we limit the issues that we address in such a policy. Or, perhaps we need a series of crises to cause reasonable men and women to sit down and come up with that policy.

It would seem to me, though, that we can agree on a number of items regarding water and some of these items could include:

1. Adequate water supplies are a national problem and not limited to the area west of the 100th meridian.
2. Water projects have a difficult time competing with other programs for federal dollars.
3. Our older cities in certain states will face tremendous repair bills during the next 20 years as their water systems continue to deteriorate.

4. Environmental programs for our water have gone a long way toward improving quality, but will not meet many of the deadlines that have been set.
5. More and more, the courts will continue to play an important role in water issues.
6. Regionalism with regard to water will disappear as perceptions change, making this a national issue.
7. Energy development will continue to place severe pressure on western water resources as well as the pressure caused by urban expansion.
8. The price we pay for water as consumers will continue to increase.
9. Water issues will begin in this decade to become more tied to land use issues.
10. There are numerous lawsuits waiting for us out there as we move toward the year 2000 that will deal with questions of allocation, state water laws, water rights and environmental questions--all of which may change our life much more than congressional action.

So, the reality can be many things. If Congress and the administration do nothing, there is still an entire set of federal programs and laws as well as state laws which defines our policy today.

Congress will make, and has made, some fine tuning adjustments to many of these laws.

In fiscal year 1981, a fuel tax was imposed on commercial cargo vessels operating on 26 specific inland and intercoastal waterways. Revenues collected will be made available--after authorization and appropriation--for construction and rehabilitation of these waterways. I might add that there is a fair amount of interest in doing something similar for our nation's ports.

After several years, Congress has passed a new reclamation law. It contains some significant changes in emphasis from the original 1902 law.

However, on another front, as we all know, new starts have, for the most part, come to a halt even though the administration has finally come up with some programs as they promised.

And, to be perfectly candid, even before Congress recognized the current budget difficulties, spending for many water programs had been decreasing on a real dollar basis.

So, the reality is a mixed collection of laws, policies and spending priorities. Will it change? Yes, it will.

I would argue that the result of what I have attempted to outline today has not been all that bad. I think that if some people can make a case that it is impossible to come up with an ideal water policy for the nation, one can also make a good argument that in spite of that fact, our hodge-podge of laws, policies and programs have served the nation very well.

Irrigated agriculture has been established in the arid regions of this country and continues to provide large amounts of food and fiber for our entire nation, as well as act as a backbone for the economy in the West.

Our nation's waterways continue to provide a means of transportation for our nation's raw materials as well as finished industrial products. Our nation's ports continue to serve both our export and import market well.

The quality of our water continues to improve and expansion of our cities and towns continues.

Today, our citizenry is much more aware of the many problems we face that concern water. And, I believe the Congress has become better educated on these issues.

I'm optimistic that those reasonable men and women will come to realize that the entire nation has a major stake in this thing we call water policy and that the Congress, in response, will continue to change those laws that need changing. And, your representatives in Washington responding to the views in their states will continue to attempt to ensure that state participation and state input is taken into consideration.

FEDERAL WATER POLICY AND NEW MEXICO WATER

Steve E. Reynolds
New Mexico State Engineer

At the Annual New Mexico Water Conference in 1980, Hal Brayman, who is now staff director of the Senate Environment and Public Works Committee, told us, "...when you look at what has happened with federal water resources development spending in Washington, it is really a tragedy." Nobody disputed Hal's statement.

I am sure Hal used the word tragedy advisedly; his background gives him a basis for understanding the unique and fundamental role that water plays in the infrastructure of our society and its economy--not only in the West, but nationwide.

The following quotation from Helene Monberg's June 1981 Western Resources Wrap-up (Series 19, No. 23, 6-4-81) may be relevant to today's agenda for the Water Conference:

> Two water experts thoroughly familiar with the water picture at all levels of government told the National Water Supply Improvement Association on June 2, "The days of massive new construction" of multiple purpose water projects "are over in the United States." They see a winding down of federal water development--for good. In the future, the big federal water agencies' business will be mainly that of operation and maintenance, they said. That's the view of Daniel A. Dreyfus, minority staff director of the Senate Energy Committee who retires on June 12 to go to private industry, and Russell R. Brown of the Senate Energy Committee staff. The current hassle over water policy looks like "beating a dead horse" to him, Brown told Western Resources Wrap-up.

New Mexico's situation is in some ways not representative of the other western states. If we think federal water policy is not dead, and I think it is not, we may want to beat the horse with a different stroke.

Much of the construction needed to control and develop New Mexico's water resources is already in place or authorized for construction, principally in the form of federal water projects. Since 1955, a total of

about $1.4 billion worth of water projects have been completed, are under construction or have been authorized for construction in New Mexico. These projects include the Bureau of Reclamation's Navajo Dam and Reservoir at a cost of $44 million; the Navajo Indian Irrigation Project at a cost of about $523 million; the San Juan-Chama Project at a cost of about $95 million; the Hooker (or suitable alternative) unit of the Central Arizona Project at a cost of $180 million; the Animas-La Plata Project at a cost of about $50 million allocable to water users in New Mexico; the Brantley Dam and Reservoir on the Pecos River above Carlsbad at a cost of about $218 million; the Corps of Engineers' Middle Rio Grande Project for flood and sediment control and water conservation at a cost of about $190 million; the Los Esteros Dam and Reservoir on the Pecos River at a cost of about $40 million; and projects of the Soil Conservation Service under the Small Watershed Protection and Flood Prevention Act at a cost of $58 million with $47 million of construction completed.

The fact that the stage of development of the water resources to which we are entitled is probably further advanced than in most of the other western states may be attributed to several factors. The federal water agencies, namely the Bureau of Reclamation, the Corps of Engineers, the Soil Conservation Service and the U.S. Geological Survey, have worked closely with state officials and have been most sensitive to the state's objectives and goals. New Mexico has been unusually well represented in the Congress by men acutely aware of the state's water needs. And last, but perhaps not least, we don't have as much water to develop as many of the other western states, such as California, Colorado, Oregon and Washington. In about 1970, when we were working hard to get the San Juan-Chama Project authorized, then New Mexico Supreme Court Justice McGee, uneasy over the prospect of the construction of works on some of his favorite fishing streams, told me, "You already have more dams and less water than anybody I've ever heard of."

While New Mexico is well along in the development and management of its water resources, and it is unlikely that we will ever need to seek authorization for major new irrigation projects, we may yet need costly municipal and industrial water supply projects such as the Gallup-Navajo

Project that is currently under study, with construction costs estimated at $200 million.

The Hooker unit of the Central Arizona Project on the Gila River and the Animas-La Plata Project in Colorado and New Mexico were authorized in 1968, but construction of neither has been initiated. The Brantley Dam and Reservoir Project on the Pecos River above Carlsbad was authorized in 1972 and appropriations have been made to initiate construction. If we had no need for any other projects, these three would be enough to give us a profound interest in a viable federal water policy.

The federal water policy situation which was described by Hal Brayman in 1980 as a tragedy and which elicited the Dreyfus-Brown "dead horse" analogy is not yet much changed, but there is reason to hope that Washington's assessment of the problem and approach to its resolution has.

Assistant secretary of the Interior Garrey Carruthers' presentation at the October 29, 1982, meeting of the Western State Engineers in Santa Fe was encouraging. He outlined succinctly, but clearly, what the Department of the Interior is doing and plans to do. He made a persuasive argument that this administration "plans to get back in the water business" after that business has been in the doldrums since at least 1976. As most of you know, Garrey is former director of the Water Resources Research Institute.

Garrey pointed out that the administration had supported the reform of the 1902 Reclamation Act that was badly needed in the West and is now accomplished. There remains only the task of writing the rules and regulations to implement the amended law. Among other features, the reform act had the effect of affirming the secretary of the Interior's earlier determination that the Elephant Butte Irrigation District, having repaid its share of the Rio Grande Project construction cost, is no longer subject to the acreage limitations of the Reclamation Act.

He emphasized that the Department of the Interior is firmly committed to the policy of deference to and primacy of western state water law. This commitment is of great importance to New Mexico and the rest of the western states. The June 1979 opinion issued by Solicitor Krulitz of the Department of the Interior, found that federal control over its needed water rights, unhampered by compliance with state law, is supported by

the Supremacy Clause and the doctrine that federal activities are immune from state regulation unless there is a "clear congressional mandate" or "specific congressional action" providing for state control (Krulitz's Opinion M-36914).

In an opinion issued September 11, 1981, the incumbent Interior Department solicitor, William Coldiron, effectively reversed Solicitor Krulitz's opinion by stating that "no existing federal land management statute can claim congressional directive of sufficient specificity to overcome presumption of deference to state law" and that under existing law, "the only water rights available to federal agencies outside of state law, are reserved rights or rights necessary to preserve the navigation servitude" (that statement would include the Federal Land Policy and Management Act of 1976 and the Taylor Grazing Act of 1934).

Unfortunately, in a memorandum issued June 16, 1982, Mr. Theodore Olson of the Justice Department submitted a memorandum opinion on "Federal Nonreserved Water Rights". The Olson memorandum reopened the question of whether water rights other than "reserved rights" are available to federal agencies outside of state law by saying that the next logical step is for the agencies with responsibility for enforcement and administration of various land management statutes, including the Federal Land Policy and Management Act (FLPMA) and the Taylor Grazing Act, to review their statutory authority and water needs and the possible problems that would be presented by application of state law. Western states' water administrators were concerned that the Interior Department's agencies, such as the Bureau of Land Management and the Bureau of Reclamation, would no longer be controlled by Bill Coldiron's opinion. The assistant secretary's assurance that the department's commitment to deference to state water law remains firm, is most gratifying.

Garrey also told the state engineers that the administration had completed the dismantling of the federal Water Resources Council that was established in 1965 by Public Law 89-80 (The Water Resources Planning Act). That action seems well advised. The view that the Water Resources Planning Act did not contribute substantially to water resources planning and development had come to be widely shared. Our primary concern arose out of the Water Resources Council's administration of grants under Title

III of the act, which were to be used to assist the states in developing water and land resources planning capability. The previous administration departed drastically from the intent of Title III by the inclusion of water management and conservation in the objectives of the Title III program, and proposed appropriations for that program substantially greater than those that had been made in the past--$50 million annually for such grants instead of $5 million. It was our view that appropriations of that magnitude for water management and conservation would be better spent if distributed to the ongoing programs of the Bureau of Reclamation, the Corps of Engineers and the Soil Conservation Service. These programs have been invaluable to us.

The guidelines proposed by the council, coupled with substantially increased appropriations, could have provided an avenue for federal encroachment on state water rights administration by the imposition of sanctions after the states have become dependent on federal grants. Some states had already become so dependent on federal grants under Title III that they felt forced to concede state prerogatives in water management to continue their eligibility for the grants and thus give the federal government a major voice in the administration of water rights established under state law.

By a notice published in the Federal Register in September of 1981, the Water Resources Council undertook to repeal the council's "Principles, Standards and Procedures for Water and Related Land Resources Planning" that had been issued as rules. That effort will be completed soon with the promulgation of the "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies". The draft that we had the opportunity to review substantially improved on the principles and standards perhaps primarily for the reason that they are to be promulgated as "guidelines" instead of "rules" to provide badly needed flexibility in water resources planning. The new guidelines also intended to strip away cumbersome red tape to speed up the process of approving economically and environmentally sound projects. While this objective was not achieved to the extent we had hoped, it may have been done to the greatest extent practicable in our day.

There is some residual apprehension about the "Principles and Guidelines". Garrey told us that Chapter 4 of the guidelines is under preparation and that it will deal with cost-sharing on federal water projects. Federal water project cost-sharing is probably the most difficult and controversial problem on the agenda of the Department of the Interior's new Office of Water Policy. That office is also headed by a former director of the New Mexico Water Resources Research Institute, Dr. Tom Bahr.

In July of 1982, secretary of the Interior Watt's June 15, 1982, memorandum to President Reagan on cost-sharing on water projects was given wide distribution as a result of what Garrey has termed a "clandestine acquisition." There is conjecture that the distribution given the memorandum was not the result of some subversive activity, but rather the inflation and release of a trial balloon. At any rate, there are a number of people doing what they can to shoot it down, including some members of the Congress.

In his September presentation in Santa Fe, Garrey properly emphasized that the memorandum does not represent President Reagan's policy. The copy I have doesn't bear his signature. Garrey told us that the administration is still working on a draft of cost-sharing policy which likely won't be completed until after the elections. I will address only some of the highlights of the decision memorandum of the Cabinet Council on Natural Resources and Environment which Secretary Watt transmitted to the President:

> The nonfederal share of capital cost for municipal water supply would be 100 percent of the cost. For industrial water supply and for hydroelectric power, the nonfederal share would be no less than 100 percent. The stated principle behind the contemplation of a charge greater than 100 percent is that if the value of water service is greater than the cost, consideration should be given to recovery of more than project costs. Urban and rural flood protection and rural drainage costs would be variable, but no less than 35 percent.
>
> The nonfederal share of capital cost for agricultural water supply projects would be variable, depending on the benefits to the water users, but would be no less than 35 percent.

There can be no doubt that those preparing the decision memorandum are well aware that under current federal policy, the users of municipal

and industrial water supplies must repay the full cost allocated to those purposes with interest; and further, that the users of hydroelectric power from basin development projects such as the Colorado River Storage Project, pay substantially more than the cost allocated to hydroelectric power in order to pay that part of the costs allocated to irrigation which are beyond the water users' ability to pay. Costs allocated to irrigation also must be repaid in full, but since 1902, those costs are repaid interest free.

The profound change proposed in the Cabinet Council memorandum is that to reduce the federal budget, the nonfederal contribution be required "up-front," that is, before or during project construction. In effect, it is recommended that the federal government abdicate or substantially minimize its role as the banker for federal water projects.

The memorandum recognizes that the presumption of "up-front" cost-sharing may be viewed as discriminatory against states with limited fiscal capacity. Considering the relative financial resources of state and local governments and the federal government, it seems neither necessary nor advisable to require the nonfederal bodies to share the bankers' role. While there is cause for concern about the federal deficit, it seems only reasonable to project that the cost of money to the federal government for long term investments will always be less than the cost of that money to state and local governments and the elimination of water projects from the federal budget would have an almost vanishingly small effect on the current deficit.

The proposal of the decision memorandum which seemed most outrageous to western water administrators is the recommendation that industrial water and power users pay more than 100 percent of project cost. Their feeling is that the federal government should not engage in profit-making on water resource projects unless that profit is dedicated to the development and management of the water resources of the states affected, for example, as in the use of hydroelectric power revenues to pay costs allocable to irrigation which are in excess of the irrigators' ability to pay. From Garrey's presentation, I now understand that that is more nearly the intent of the proposal, and that later, further elucidation

will make clear that it is not the administration's intent to pay off the national debt by profit-making on water projects.

If the federal government is going to require 100 percent up-front financing for its water projects, the question arises as to why the local interests would want to involve the federal government. If the intent is to charge more than the project costs up-front, there would be considerable incentive to avoid federal participation. Our partnership with the federal water agencies likely would dissolve; my personal view is that that would be most unfortunate and not in the national interest.

The Cabinet Council recommendations are not clear on the question of whether the proposed new cost-sharing guidelines could be applied to the projects already authorized by Congress, but one can reasonably infer from some of the statements in the memorandum that such application is intended. This question is of fudamental importance to New Mexico. The equity of "changing the rules in the middle of the game" is most evident where project, or separable units of projects, which have been authorized as a part of a basin-wide development are involved. For example, in 1968, the Colorado River Basin Project Act (Public Law 90-537) authorized the Central Arizona Project, including Hooker Dam and Reservoir or suitable alternative unit in New Mexico, and a number of other projects in the Colorado River Basin states, including the Animas-La Plata Project in Colorado and New Mexico. The act accommodated the interests of all seven of the Colorado River Basin states after years of controversy, litigation and negotiation. Constructon of the Central Arizona Project was initiated soon after authorization, but appropriations for some of the authorized units of that project and some of the other authorized projects have been held up so that orderly and timely development may take place.

Under the terms of the Colorado River Basin Project Act, the Hooker unit in New Mexico may not be operated until the Central Arizona Project is capable of delivering water from the Colorado River to the Phoenix area to effect an exchange; thus, some delay in initiating the construction of the Hooker unit was logical. Those authorized projects which have been delayed to provide an orderly construction schedule or because of budgetary constraints, should not be penalized for that delay by being

subjected to cost-sharing provisions more burdensome than those imposed on the companion projects already under construction.

New Mexico is not alone on this point. The "Western States Water" newsletter of October 1, 1982, quotes Gov. Babbitt of Arizona as saying that the first priority must be to "maintain the position that the policy does not apply to existing and authorized projects such as the Central Arizona Project."

Another very important element of cost-sharing policy either ignored or overlooked in the Cabinet Council recommendations is that any fundamental change in policy, such as those suggested, should be approved by the Congress before the administration undertakes to implement them. There can be little question that the Congress will see it that way. The administration's current practice in advising those interested in federal water projects that they will receive favorable consideration in the administration's formulation of its budget proposals if they volunteer to participate in up-front project financing has evoked a sharp reaction from the Congress. Language in both the House and Senate Appropriations committees' reports on the FY82 Supplemental Appropriations Act, on which the president's veto was overridden, directed that "no cost-sharing or innovative financing proposal be implemented until the Congress fully considers and authorizes such a plan."

While I am not persuaded that it is necessary or appropriate to modify current federal water project cost-sharing policy, I must admit that federal water resource project development has been in the doldrums for at least six years and that there are those who are persuaded that the time for such change has come. Among those are at least a former president, a number of senators and congressmen and some committee staff members, like Hal Brayman, who may have as much influence as the others. We must not close our minds on this subject and if some change in cost-sharing policy is necessary to get water resources development moving again, so be it. S.621, the Domenici-Moynihan bill to authorize the National Water Resources Policy Development Act of 1981, with a few clarifying amendments, would be preferable to the recommendations of the Cabinet Council as I now understand those recommendations.

STATE WATER POLICY -- CHANGE OR STATUS QUO?

Hoyt Pattison
New Mexico State Representative

It's a pleasure to have the opportunity to talk with you about a subject as important as water. You know the old saying that "You don't miss the water until the well runs dry." That is certainly true. That's why meetings such as this and work in developing and conserving water resources are very important. This morning I would like to visit with you about our state water policy. We've already heard a great deal about federal water policy and federal water law--or the lack of it. We've even heard a little bit about our state government. But I think we need to realize that state water policy is very important, particularly in New Mexico, because it is the foundation for water use in our state.

I am reminded of the story of the second grade teacher who instructed her class to draw pictures of the subject that most interested them. When the teacher went around the room, she noticed that Mary was drawing a picture of flowers. The flowers were interesting and the teacher complimented Mary on them. The teacher saw that George was drawing a picture of an airplane and she also thought it was very good. But in the back of the room sat Larry busily scribbling. The teacher asked Larry, "What are you drawing?" He answered, "I'm drawing a picture of God." And she said, "Why Larry, no one knows what God looks like." Then he said, "In a minute they will." I'm not here to tell you that in a minute you'll know all about state water law and what policy we're going to have in the future, but I hope to shed a little light on those subjects.

"State Water Policy--Change or Status Quo?" will deal with water rights, exports-imports, changes in use, conservation and research. New Mexico's water law originated before statehood--perhaps even before "United States-hood." The Indians, for sheer survival, were using irrigation in New Mexico before the Europeans settled in this country. From that time, the law has been based on the fact that the first guy to use

it had the prior right to use it. That is unless someone bigger and tougher came along and said he was going to use it.

We're faced with that same situation today with the El Paso case. Maybe they're bigger and tougher than we are and maybe they're not. But we have the basic water law of the state of New Mexico to fall back on even if the courts should rule in their favor. And under the able administration of Steve Reynolds and our State Engineer Office, I would predict that if that horrible eventuality should take place, El Paso is not going to steal our water. They're going to have to get it the same way the citizens of the state of New Mexico do. And they're going to have to abide by the same laws because they will be using New Mexico-granted water rights whether they purchase them or file for available rights, if any exist.

I'd like to answer the gentleman who asked, "What's the difference in eastern rights and western rights?" Back East where they have got a lot of water, water rights haven't always mattered. If the water runs by your door, you have a right to it. If it falls on your land or if it's under your land, you have a right to use it. But here in the West, that's not so because there's not enough water to go around. Here we have the right of prior appropriation. The guy who got there first has the prior right to the water.

Water policy in New Mexico, of course, yields to public opinion through the basic policy-making organization in our state, the New Mexico Legislature. Other state agencies such as the State Engineer Office, the Environmental Improvement Division, and the New Mexico Bureau of Mines and Mineral Resources are involved in implementing water policy to some degree. By far, of most importance is the State Engineer Office because it administers the basic water law. Basic water rights are established and protected through that office and also, of course, through the courts. However, water policy is formalized into law by the Legislature.

Presently, the predominant owner of water rights in New Mexico, by volume and value, is agriculture. Agricultural users and agricultural owners of water rights in New Mexico, of course, are historic because they had the first need. Of course, with the advent of population cen-

ters such as Albuquerque and Las Cruces within our state, the need for municipal and domestic water rights has grown, as has the need for industrial, commercial and recreational water use. Allowances for this growth have been made in the state law, but the basic principle remains: If you want a water right and there is not an unused right available, you buy it. You compensate the present owner. Remember that a water right is a property right. With the majority of our water rights in agricultural users' hands, cities, industries and recreational users who want rights, simply just buy them.

By the way, with the present condition of agriculture in our state and nation, you might find some rights for sale because that might be the most promising source of income for a lot of farmers. They could just sell their water rights, get out of farming completely and quit bucking the trend of low farm prices. I can illustrate that for you. I eat a cereal for breakfast called Nutragrain. It's a flaked wheat. Kellogg's rolls it and flakes it and sells it in the grocery store for $1.29 for a 12 ounce box. Farmers get a nickel of that $1.29. The state gross receipts tax is more than what the farmer gets. It's pretty tough on farmers, so we're all looking for other things to do. Politics isn't an alternative because it doesn't pay anything either. Thanks to the voters, though, it will be a little bit better than it has been.

The question of exports and imports would almost be moot if it weren't for the El Paso case. The truth is we just don't have any water to export. Any water that goes out of New Mexico goes down the Rio Grande, the Gila, the Pecos or other streams and rivers. The only reason that water leaves New Mexico is because somebody else has a claim on it, otherwise we'd be using it. If El Paso should win, then we may be exporting some water, but only after they go through the process of proving that the wells they drill will not infringe upon existing rights. The principle of protecting existing rights is deeply embodied in New Mexico.

What about the import question? I don't know how many people have thought about it, but it's very possible that an adverse decision in the El Paso case might benefit some parts of New Mexico. Texas doesn't have the kind of water law that we have. Unless you're in a localized, under-

ground water conservation district or irrigation district, you can drill a well and pump out all the water you want to. No strings attached. For example, the city of Hobbs could just go three miles and buy a 10-acre block and drill a well. It could buy another 10-acre block, drill a well and just pump all the Texas water they wanted to into New Mexico. So I'm not sure the rest of Texas agrees with what El Paso's trying to do. And the same application would apply in any area where New Mexico borders Texas. So maybe the El Paso case is not all bad. It might have the long-range advantage of importing major water supplies into our state. Water Incorporated, for example, is working on a project to take flood waters and excess waters from areas that drain into the Mississippi River and transport them to Oklahoma, west Texas and New Mexico. The purpose is to take water that is damaging to other areas and use it to our advantage here in the West. Of course, that's a long-range, high-cost project and economic conditions and energy needs would have to change drastically before importation would ever materialize. But as time goes by, the laws and policies will evolve to make these projects possible if they're needed.

Changes in water use in New Mexico from agricultural uses to industrial, commerical, residential and recreational uses are taking place all the time. The recreational and tourist industries have bought agricultural water rights and have gone through the proper processes to transfer the use from agricultural to recreational and domestic. In eastern New Mexico, municipal governments have bought agricultural water rights and converted them to municipal uses. This is the marketplace approach, and it works. Water rights are selling for $3,000 to $5,000 or more per acre-foot, depending on where the rights are, who owns them and the demand. It's conceivable that with land going out of agricultural use, those water rights could be utilized to the advantage of the people who need them. It could also work to the advantage of the people who own them now and who would like to sell them if the dollar figure is high enough. That's the principle on which our nation's economy works so there's nothing wrong with it, basically.

In talking about conservation of water rights or of water itself--the phrase "more miles to the gallon" might apply to water as well as energy.

The objective in both cases is to get more use out of the same gallon. In agriculture, the search for "more miles to the gallon" is going on, again, because of the economic situation. For example, in eastern New Mexico, we pump our water from underground basins to irrigate our crops. Or maybe I should say, we used to. The biggest conservation measure that has taken place in that area has not been by law. No government agencies came around and said, "You guys have to conserve this water. You have to keep it from going down the bar ditch when it runs out of the end of your field into some playa lake someplace." The energy crisis did that and took care of conservation very well. If you see water running down the bar ditch, you can say, "There will be a broke farmer, and in the not too distant future." When natural gas was 35 cents a thousand cubic feet, it was pretty easy to ignore waste if you weren't conservation minded. Even then, however, conscientious farmers dug a great many tail water pits and took conservation measures because they knew water was not an inexhaustable resource. But when natural gas costs increased to $3.50 a thousand cubic feet, it makes a whole lot of difference. In fact, it makes a difference as to whether that farmer even cranks up a well. It proves Steve Reynolds right, once again. I remember when we first started irrigating in eastern New Mexico. People asked Steve Reynolds, "Well, when are you going to declare an underground water basin in Curry County?" And Steve said, "Why, that water is too deep to pump anyway, they don't have any business irrigating with it. We don't have to declare an underground basin. The economics will take care of it." He sure was right. The economics have taken care of it. The water will be there for a long time for someone who is willing to pay the price to pump it out.

Different methods of conservation have been tried through irrigation. Sprinkler irrigation was used earlier, but it lost too much water to the atmosphere and so farmers have gone to low-pressure sprinkler irrigation. They're just running it out into the sprinkler and using that for a distribution system and then dribbling it onto the ground. We tried high-pressure irrigation in 1964 with three of the big circular sprinklers. But my dad said, "You don't want to throw that water up in the air." He was right. On a windy day you could feel the spray half a mile away.

And so we changed it. We fixed it so that it would go down to the ground under low pressure. Presently, most of the sprinkler irrigation makers, because of the energy situation again, also are going to low-pressure systems. With that system, you don't need nearly as much pressure to spread the water as you do with normal high-pressure sprinklers. Drip irrigation is a high return, as well as high cost, operation. In an orchard or vinyard you can drip irrigate and individually feed each plant. This is being looked at on a field crop basis, but as yet is unworkable because of the capital costs and the short life of those installations.

Alternate crops is another area in which conservation can be practiced. Just grow something that doesn't take as much water. In other words, if you grow alfalfa, you've got to use a lot of water. Alfalfa used to take three acre-feet. I doubt if it uses that much now except for full production. Corn takes a lot of water. If you're willing to spend the money and pump it, you can grow a heck of a corn crop. But, the point of diminishing returns economically may be with a lot smaller corn crop grown with a lot less water. Or, grow milo instead. A fellow told me yesterday that he planted a crop of milo in stubble without doing very much preparation. He had one watering in early summer and one later, and it cost him $58 an acre. He made 4,500 pounds. Compare that with the corn operator who had $300 an acre in his crop and made 7,000 to 9,000 pounds of corn. I'll bet the guy with less yield and less expense made more money. That's what we need to be looking at in water conservation.

Research is another area of concern in state water policy. Research is where you sometimes find out about new ways of doing things. For example, our agricultural experiment stations around the state are experimenting with alternate crops such as kochia that will produce three to four tons of dry matter per acre, sometimes even under dryland conditions. When you see that plant growing five and six feet tall just from rainfall--of course it would have to be a wet year when it did that--you realize there are alternatives. Kochia will make hay and if you let it get that tall, why it will even make fuel. If you don't believe it, just try to burn a patch of it and not have room to get back far enough.

There is certainly a lot of biomass on our farms that can be converted to energy for pumping some of this expensive water.

The Water Resources Research Institute is an organization that, as it's name implies, directs research in the water resources area. The state government has appropriated funds to the institute for water research. It also has appropriated funds to the Interstate Stream Commission for water research in the areas of new crops and conservation. As a person involved in state government, I believe that most legislators are sympathetic and look positively on the need for this type of expenditure of state funds.

We've also spent vast sums of money to put gates on Ute Dam so we can hold onto the Canadian River water that belongs to us instead of letting the Texans in Amarillo and Lubbock make use of it. So, we need to be certain that state government continues to fund the essential water resources research projects in New Mexico. And we need to encourage private capital development of water rights and of water resources where the water is available but not being used. For example, we need to know the extent of the ground water reserves in the Tularosa Basin and the Rio Grande Valley and how much of those resources could be used without impairing the rights of present water users. We need to know this information to help develop the economic picture in our state. It is essential that state policy concerning water in New Mexico remember our basic water law and basic water rights and consider the possibilities of import-export, water conservation, water resources research and water use research.

WATER MANAGEMENT

Toney Anaya
Governor-elect of the State of New Mexico

Little is more precious and vital to our well being than the supply and quality of our water.

We want to assure that we do not have to face desperate men who are without hope or knowledge of what to do next. We want to husband, conserve and use wisely, this precious resource that is so vital to our lives, our heritage and our future. We want a water policy that will enable us to grow economically, but at the same time, will protect our environment and the quality of our life.

We want even more. We want to be able to assure our future generations that they will have the possibility of living as well, if not better, than we do today. This is the legacy we want!

Water in New Mexico is a resource under stress. By all forecasts, it will remain so. You, attending this conference, are well aware of the problems we face. I'll quickly sketch out the ones of paramount concern.

Our first concern is that our surface water supply is limited and virtually fully appropriated. This means that not all demands for water can be met in the future.

Potable ground water is undergoing marked depletion around the state. The depletion in the southern High Plains area has now moved from a chronic to an acute problem.

Other problems come from outside our state where Texas and Colorado are making major assaults on our water supply. We also face critical problems with our Indian friends with whom we have to live on mutually acceptable terms. We still face problems with some federal government agencies over water demands.

Our water quality increasingly is showing signs of man-made and natural degradation. Degradation affects the use of our available supply and threatens our future supply. Degradation poses disturbing, and at times unacceptable, public health risks for our people.

The prospects for augmenting our present supply by discovery of new ground water sources, or importation of water from sources outside of the state, and desalinization technologies are unlikely for the near term. Yet, I'm committed to pursuing some planning efforts in this area.

This profile indicates that we face tough problems. Water is under stress. However, there is much that can be done and good reason to be optimistic. With foresight and deliberation, we can develop a sound water management policy and realize the future we dream about rather than live in constant fear or without hope.

During the campaign, I pledged my fullest attention to an effective use of the governor's office to ensure the protection and wise use of our water resources. I am now prepared to fulfill that pledge!

The Anaya agenda for an effective water policy was carefully prepared last year and published in January 1982. Today, in my first statement on water policy as governor-elect, let me tell you some of the key elements we planned over a year ago that we will now put into effect. We will immediately create a cabinet position for the management of our water resources. The function of the secretary of Water Resources and Quality will be to advise the governor and cabinet, help to develop policy and to ensure the effective management of our resources in a well-planned and integrated way. We believe this will help improve upon the administrative system that presently exists.

We are carefully reviewing the present statutes and administrative powers and arrangements. We believe the present legal and administrative structure is basically sound. We are preparing some recommendations to the state Legislature to amend the statutes, but we will have more to say about this later.

Another function of the secretary will be to meet, along with the governor, with the members of the various commissions, boards and advisory councils on a periodic basis. The goal is to ensure that we have both an effective water policy and continuity of policy by individuals setting regulations or determining water policy for the state. In this regard, we will beef up the public participation process. We see this participation as an essential part of our effort to realistically solve

our water problems. The public participation process in the water management area has not been as strong as it should have been.

While I believe the state's water is relatively well managed, I am skeptical of any "fox guarding the hen house" arrangement that allows representatives of state agencies to sit on commissions where they make policies without much citizen input on a membership level and then implement the policies that they have just adopted. The public, as the ultimate consumer of all policies, has as important a role to play in the determination of policy as has the state agency representative or any economic interest.

My philosophy on this point is clear and simple. While I believe the governor is the single individual elected by the people to run the executive branch of government, I also believe that agency representatives can too easily be separated from the public. To ensure a balanced approach, to build in equity and to rest government decisions on a consensus, I believe we must have more public participation in the form of membership on boards and commissions.

To further ensure the effective oversight by tne governor's office, we are designing a new management program that will encourage performance consistent with our objectives. This new program will not replace the present administrative structure. The management program will be a new tool and will be used to supplement present management systems within and across agencies. Based on the principles of management by objective and an independent audit of performance, the management program will enable us to eliminate vagueness of programs and duplication of functions. It also will ensure that all agencies integrate each others programatic needs as they seek to realize their specific objectives. (For example, people in economic development should be cognizant of EID's programs as they seek new industries for New Mexico and vice versa.) Finally, the program is designed to enable us to realize flexible and cost-effective management.

This administration plans a slightly different emphasis with regard to water management than perhaps has been the case. Traditionally, the focus has been on water availability--on measures to increase supply. While this is seen to be very important and efforts along these lines

will be increased, the focus of this administration will also be on water quality and water conservation measures.

We believe the best way to get the most out of our available water is to ensure its quality. In other words, the protection of our water quality is the paramount water conservation step available to us. If we want to recycle water, then we must reject any presumption of pollution. No one has this right. We must protect its quality.

We are clearly convinced that it is better and cheaper to protect our water supplies from contamination than to try to clean them up afterward. This is particularly the case with ground water. The cleanup of polluted aquifers is very expensive and not at all certain. We are clearly convinced that protecting water quality is the best way to protect public health. It is better to ensure that the public is protected from acute and low level, long-term exposures to toxic contaminants caused by man-made discharges which we can control, than it is to impose additional lifetime health risks over which the public has no control and does not want.

We will introduce a programatic effort to realize these objectives. Specifically, we hope to encourage water conservation projects for agriculture and rural communities that will help offset the high costs of water use and will improve the quality of small municipal water supplies. It is estimated that a 10 percent increase in water use efficiency in agriculture would save enough water to serve a doubling of our population and industrial uses.

We want to encourage industrial recycling of water to remove toxic pollutants and to make it possible to conserve water by reusing it. We hope to encourage industry to use saline water when it is applicable. The recycling of water may mean the use of stringent standards. The economic impact must be considered, but it is evident that it is cheaper to protect water quality against pollution than to clean it up for reuse afterward. Regarding saline water, I support the efforts of the New Mexico Water Resources Research Institute and commit to obtaining state funding for that effort.

We want to step up efforts at improving municipal water works, water quality and conservation measures that will help us protect downstream

users from downgraded water caused by the effluent discharges from the sewage treatment plants. We believe the quality of our water must be protected and upgraded when and where it is possible, even if we allow for "reasonable degradation."

Indirect or nonpoint sources of pollution control projects deserve to be upgraded. If New Mexico has a water pollution problem, it is a consequence of soil erosion and toxic runoff from city streets during summer storms. The man-made dimensions of this pollution problem are probably greater than the natural source. We must assign greater priority to gaining control over the various man-made sources of indirect pollution.

We would like to see studies, resource investigations and evaluations that go beyond traditional concerns and include the protection of fish, wildlife and recreation. With regard to recreational needs, we are concerned about the need to protect the stretch of the Chama River covered in the El Rio Chama Scenic and Pastoral Act. We understand a compromise has been proposed that will enable the City of Albuquerque and the people who use the river for recreational purposes to accomplish their respective objectives of water storage and river rafting. We will instruct the State Engineer to use his good offices and expertise to help facilitate this compromise in his dealings with the Interstate Compact Commission, the federal government, the City of Albuquerque and the public. If studies are necessary, his office, as the most capable of all, should provide them.

Since the protection of our water supply is critical, the governor's office will do all it can to enable the State Engineer, the Attorney General and the Legislature to adequately protect the state's interests against assaults by Texas and Colorado. Our office will also call for a review of all options to help the people of the southern High Plains area of New Mexico.

With regard to conflicts with our Indian friends, it is essential that the state protect its interests. It is our belief, however, that the conflicts need to be settled in an amicably and mutually beneficial way. Our reason is simple. If we cooperate, we all benefit. None of us can afford to lose our water. I welcome negotiations on these questions

and am willing to lend the governor's office in the assistance of these conflicts.

Finally, with regard to the numerous federal agencies, the governor's office will undertake direct efforts through its staff and outside help to assist in resolving major conflicts. While the state will relentlessly seek to protect its interests, I believe a joint partnership with the federal government has made it possible to make headway with regard to water supply and quality projects. In the water quality area, the governor's office will encourage beefing up of the state's efforts when the federal government fails to act or when state action is necessary.

While we are concerned about maximum supply, we believe a strong emphasis on the protection of public health and the environment is the only way to protect the public interest and to assure the maintenance of a high quality of life.

These measures are some of the items on my agenda as governor. We see the measures as the foundation for the realization of a more effective water policy for New Mexico. They are designed to address the real needs we face. They represent a basis upon which we can address our water problem, build a consensus and face the future--not with fear, but with hope and foresight.

I welcome your input.

WORKSHOP I REPORT: THE NEW FEDERALISM IN WATER RESOURCES PLANNING

Comments by Workshop Discussion Leader Jim Daniel, District Chief, U.S. Geological Survey

Our group felt strongly that we should identify our concerns with the new federalism and water policy rather than make specific recommendations. The group did suggest that the published proceedings should be distributed to symposium participants, all state legislators and the principal executive branches of state government.

Topics for Discussion

1. Cost Sharing. The group agreed that because cost sharing is already written into the regulations, they should address the principal change in the "new federalism" which is the up-front nature of the money being available. We did not reach a conclusion for that concern but we did want to express it as having validity.

   The other item under cost sharing is the concern that the floor on the cost sharing percentages seems to be a standard rather than a guideline. The percentage of cost shared should have the flexibility to take into account benefits applied to national versus regional needs.

   The group also raised the question of who will be the banker under the new proposals. If we have new partners who have to be repaid, what is the mechanism for that repayment? Perphaps the Water Resources Research Institute will come up with the research needed to determine how to appply, or how to develop appropriate guidelines for cost sharing percentages.

2. Principles and Guidelines. The group saw the need for some criteria on which to judge the validity of a project. There was a lot of discussion on what that criteria should include. For example, the criteria that set the discount rate to be used in considering the cost/benefit ratio of a project could have a drastic effect on the relative worthiness of the project. This is why the group seemed to

favor the guideline concept as the perfect approach to setting project criteria.

3. Planning with Competing Uses. There were special concerns from the group about the effect of letting the markeplace set the priorities for which projects are to be built. There was concern that somebody might have the capability to buy every project for a particular competing use. The group did not discount the marketplace concept, but it did express the need for some policy guidance in setting limits on the marketplace approach.

   Guidelines that recognize and consider variations in state laws on water rights, beneficial use and consumptive use also are needed. The group felt, for example, that there should be some way to compare a North Carolina project with a Nevada project. The group also raised the possibility that without planning, two federal agencies, each pursuing its separate mission in good faith, could come up with differing answers on the effects of a water resources project.

4. Reserved Rights. In New Mexico, the primary concern with reserved rights is water rights. The group agreed on the necessity of quantification. The group did not completely agree about the guidelines for quantification. The difficulty in reaching an agreement on the guidelines arose because of the differing systems used to quantify uses. One system, for example, exists for Indian water rights under the Winter's Doctrine while a separate system under state law exists for other water users. The group also raised the question of guidelines for negotiating reserved rights. For example, Who is to be a party to the negotiations, and what defines a "participating party?" Although there was considerable skepticism about the success of negotiations, certainly the group felt that negotiation of reserved rights is a valid policy.

5. Water Quality. The group felt that existing federal laws do provide for water quality problems such as identification, regulation, clean-up and reclamation. However, they also believed federal water policy should specifically recognize the state's primacy role in problem identification and prioritization.

WORKSHOP II REPORT: CLOSING THE FEDERAL GAP IN WATER RESOURCES PLANNING

Comments by Workshop Discussion Leader Tim DeYoung, Assistant Professor of Political Science, University of New Mexico

Our group didn't come up with specific conclusions. However, many excellent observations were made based on some underlying assumptions I think we all shared. First, the group assumed that research coordination between federal and state agencies is important in setting priorities for research needs and in solving water resources conflicts. Second, we assumed that the burden of research costs will be borne by the state. Because of this assumption, we began to look at the types of recommendations we could make to the state. We shared the belief that the potential benefits to the state for assuming some of those federal activities far outweighed their political and environmental costs.

The third general assumption was that since the federal government already is so involved in the control of Indian as well as non-Indian lands in our state, continued federal involvement is inevitable. Because of this involvement, the federal government should be expected to contribute in some way, either financially or in terms of guidelines. In spite of the uncertainty caused by the federal government's policy changes, the group expressed the desire to enhance the continued coordination between state and federal activities.

Topics for Discussion

1. Continuity and Coordination of State/Federal Activities. The group saw the need to strengthen continuity and coordination in research, data gathering and technology transfer among researchers in New Mexico and between state and federal governments in areas where their goals overlap. Some in the group felt that the enforcement of water quality standards sometimes falls between the cracks of federal and state jurisdictions. One member of the group said the Water Resources Research Institute should be retained in its function as a clearinghouse for water resources publications and as the coordinator of

water research activities. Supporting the institute in this role is important even if it requires increased state funding.

2. Funding Priorities. The group requested that a method be developed for setting priorities for funding water research projects. This request raised questions about who will develop these priorities. Is it the state Legislature's responsibility? Or does that responsibility belong to state water administrators? Is it the public's responsibility to increase their participation in the decision making? The group felt that clear priorities needed to be developed with the ultimate responsibility resting with the Legislature.
3. Negotiated Rights. Some members of the group were concerned with the conflict over water rights between the state and the Indian nations. The group proposed that a permanent state agency be established to negotiate problems that affect both the state and the Indian nations.
4. Site-specific Standards. Some also voiced displeasure over trying to comply with federal standards that were developed elsewhere. The problem with these federal regulations is that they are not site-specific and are not relevant to New Mexico. The group recommended that the state develop site-specific methodologies and critera for measuring problems in water resources, water quality and water availability. The group suggested that wherever possible, the state should use federal documents as a standard, while adapting those regulations to situations peculiar to New Mexico.
5. Water Administration. There also was some dissatisfaction with the fragmentation of state water administration. For example, the lack of coordination between the administration of water quality standards by the Environmental Improvement Division (EID) and the water rights administration of the State Engineer suggests the need to coordinate these types of activities. Governor-elect Anaya seemed to have coordination in mind when he proposed to establish a cabinet-level Water Resources office.

6. Conservation. Finally, the group suggested that the state promote conservation through various means. We discussed the possibility of inverted pricing schedules. Some suggested that state agencies such as universities set a better example for conservation. Be that as it may, the question of the state's role in water conservation remains. The group agreed that water conservation and more efficient use of water definitely is important.

WORKSHOP III REPORT: WATER RIGHTS

Comments by Workshop Discussion Leader Fred Allen, Director, Technical Services Division, State Engineer Office

We were fortunate to have the students in our workshop. Their presence underscored the point that we are involved in the conservation and protection of water rights on behalf of the young people in this state. We sometimes forget that we're making decisions that will affect their future. We were also fortunate to have a good audience. While our action proposals are short, we believe they are thoughtful.

Topics for Discussion

1. Appropriative Rights. The group suggested that we ask our congressional delegation to clarify water policy on the national level. In doing this, we suggested that existing water law be recognized and that appropriative water rights specifically be exempt from further federal action under the commerce clause. The group also requested that a clear distinction be made between eastern water rights and the appropriative rights of the western states.
2. Reserved Rights. The group encouraged the expeditious settlement and quantification of reserved water rights by negotiation at the state and federal level. I should point out that I don't recall a single negative vote on these first two issues. Some of the federal people, including the Indians, expressed the desire to negotiate.

DISCUSSION OF WORKSHOP REPORTS

Discussion Moderator Albert Utton, Professor of Law, University of New Mexico

The comments below represent views expressed by workshop participants attending the general session. Following each question are reference numbers for the topic under discussion. For example, II-5 means the question refers to discussion raised in Workshop II, topic 5.

1. Question: What steps are being taken to improve coordination among state agencies? (II-5)
   Discussion: Under the New Mexico Water Quality Act, the Legislature arranged for careful coordination in the activities of those agencies by having the State Engineer represent both the State Engineer Office and the Interstate Stream Commission on the Water Quality Control Commission.
2. Question: What is being done about water conservation in New Mexico? (II-6)
   a. Discussion: The New Mexico Legislature deserves credit for appropriating about $300,000 each year for research, conservation and development. Since the act providing the money was passed in 1975, those funds have been used by the Water Resources Research Institute and other state institutions for conservation research.
   b. Discussion: A key provision in the Sporhase decision was that an arid state could conceivably ban the export of its ground water if the ban was part of a conservation plan safeguarding the health and welfare of its citizens. New Mexico, through its various statutory provisions and administration, provides mechanisms for state-wide conservation.
3. Question: Should New Mexico administer a state-wide pricing policy or should that regulation be left up to local communities? (II-6)
   Discussion: The state does not sell water, although many have suggested that a severance tax for water might inhibit exportation. But if New Mexico had a water severance tax, every citizen in the state

would have to pay it too. Pricing is a more important measure with respect to conservation of municipal supplies.

4. Question: Is it necessary to establish an additional state agency to negotiate state Indian water and land disputes? (I-4, II-3, III-2)

   a. Discussion: Although we didn't vote to establish a negotiating agency, the general sentiment was pro-negotiation. How that would be accomplished is another matter.

   b. Discussion: I suggest we take out the phrase "establish a permanent state agency" and go forward with that.

   c. Discussion: Negotiation doesn't have to be done by a state agency. Some other body, such as the Commission on Indian Affairs, could be used as a vehicle for negotiation. That's just one possibility.

5. Question: Could a state agency carry out the mandate of negotiated settlements or would it have to be a federal agency with a broader base? (II-3)

   a. Discussion: We all realize that the Bureau of Indian Water Rights is really the Bureau of Indian Tribal Administration, the BIA, the Interior Department. We can assume their participation in the future for negotiations. I think the sentiment is toward negotiation rather than litigation.

   b. Discussion: I'd rather leave the decision of who will negotiate up to the Indian Legislature of the region. It is for them to make that decision. Of course, we can probably make recommendations to them. A statement was made here that the Indians are in support of negotiations. A show of hands for and against negotiations was asked for, however, no one asked for a show of hands for abstentions. I abstained because I think it's up to the Indian leaders in the country to make that decision.

6. Question: Should we have a specific legislative effort to ask Congress to clarify water policy, to recognize existing water law, and to exempt appropriative water rights from the commerce clause of the U.S. Constitution? (III-1)

   a. Discussion: How do you legislate an interpretation of the Constitution? I understand that in Sporhase, the Supreme Court holds

that water is an article of commerce and therefore subject to the Commerce Clause. The real question is can you legislate an interpretation of the Commerce Clause?

b. Discussion: The ultimate law is, of course, the Constitution. The Supreme Court sits as guardian of the Constitution to determine whether all of these governmental actions, including legislation, square with the constitution. This legislative act runs the risk of being declared unconstitutional because it is an impediment and an unreasonable burden on the commerce clause of the U.S. Constitution.

c. Discussion: The founding fathers wanted goods to flow freely from state to state. We always thought water was something different, not just a mere commodity. But Sporhase ruled pretty strongly against that, so the legislation would certainly have to be written around the Sporhase language.

d. Discussion: As I understand the Constitution, Congress has tne power to regulate interstate commerce. It could, I would think, enact an appropriate statue which would hold that water is not an article of commerce. I would suggest, however, that it is not timely to undertake such legislation.

e. Discussion: Congress really can do anything it wants. At the hearings Sen. Abnor had in a Senate subcommittee on water resources, a number of state businesses came up and cautioned the Congress not to be too hasty in this regard. You're entering a situation that could backfire in the West. Such legislation should be very carefully thought out.

7. Question: On the one hand if we say that water is an not article of commerce but on the other hand we have a water rights project where water is allocated to its highest use in a commercial sense, isn't that a contridiction of some sort? (III-1)

Discussion: I think what was said is that you may not declare water to be a noncommodity, but at least Congress does have the power to regulate the flow of commerce, which it does, down to the weight allowed per truck axle. Commerce cannot be inhibited completely, but it may be regulated.

8. Question: Who should pay for the settlement and quantification of reserved water rights? (III-2)

   a. Discussion: We can encourage the quantification of water rights and negotiations, but we also need to weigh their costs. It might be necessary to encourage the federal government to assume or at least share the burden of these costs.

   b. Discussion: The only way I know of to quantify and negotiate settlement of water rights is with water or money. And we don't have either in very large quantities. The state cannot sit down and negotiate away claims of rights under state law. In a negotiation, if every right owner is not a party to that negotiation, there seems to be a failure of due process. Some streams have rights held by 10,000 people. That's difficult negotiation. I think the Tribal Council might feel quite uneasy sitting down negotiating away any part of the Indian claims to water rights. If we're going to negotiate Indian water rights, it may be necessary to involve federal money. Federal money was involved recently in resolving the Papago problem.

9. Question: Because the courts sometimes take decades to resolve a case, isn't there some mechanism we can set up for negotiating? (III-2)

   a. Discussion: There is additional difficulty in the negotiation process and that is the wide disparity among the plaintiffs in terms of the standards which govern the amount of water claimed, the standards which govern priority of the water claimed and finally, the very serious problem of whether or not those rights are vested.

   b. Discussion: Regardless of a negotiated settlement, these things are still going to get back to court very quickly because so many parties are involved.

   c. Discussion: Negotiations among the states over interstate waters is common. New Mexico is party to eight such agreements, which apportion the water among the states involved. The states are clearly

impowered to negotiate among each other, reach an agreement, and then gain the consent of Congress to that agreement. I don't think there's a similar relationship with respect to the states and the Indian tribes. That's the difficulty I see with negotiating settlements with the Indian tribes, unless you have lots of water or lots of money.

d. Discussion: I think the Navajo Indian Irrigation Project is an example of cooperation between the state and the Indian tribes. New Mexico should be proud of the project. The state fought hard to get the 110,000-acre project initiated. When it's complete it will cost $400 million. When the project was initiated, the state didn't ask, "What are your rights?" The concern was only that the Navajos needed the project. They wanted it badly. The state supported it because at the time there was plenty of unappropriated water to take care of the project.

10. Question: The Indians are also members of the federal system, and in some views they would be able to negotiate with the state as equals. Under some circumstances, such as interstate compacts, the state is able to negotiate water rights on behalf of the citizens without bringing them in. Could interstate compacts be a model for negotiations? (I-4, II-3, III-2)

a. Discussion: If negotiations are to proceed, a compact would certainly be a viable model. I think an interstate compact model or something like it, that reduces the number of parties to a manageable level would be necessary for effective negotiations.

b. Discussion: With interstate compacts you're not taking water away from one entity and giving it to another. It has not been clear that the compact arrangement is a good model for negotiation with the tribes. Compacts were largely agreed upon in advance so that the water supply was being divided rather than being taken away. My point was that you are looking at different issues in compact negotiations. In negotiating you're not talking about realocating water between two groups in society.

c. Discussion: Negotiations can't really be successful if one party is not going to compromise in some way. That includes the state office. They're not willing to negotiate away what they claim are their rights, so there's really no point in negotiating if both sides aren't going to be able to give in. I think that's a little bit different from aportioning water among the states.

11. Question: What is the status of legislation requiring that all non-reserved federal water rights be acquired according to the laws of the states where water is appropriated? (III-1)

Discussion: The Justice Department is still looking at it. I'm satisfied it is resolved with respect to the Interior Department. However, they're not the only agencies interested in water.

12. Question: What is being done to encourage industry to use saline water rather than transferring uses from agriculture to industry? (III-4)

a. Discussion: By encouraging the use of saline water, we're assuming that water isn't in motion and isn't discharging anywhere. We may, by using the deep water, do nothing more than cause a mixture of the fairly good water with the bad water. I'm not sure that using saline water for industry is physically feasible. Even if it is feasible, how are you going to dispose of the part you don't want--the salt? Where are you going to put it? Until the problem of disposal is solved, I'm not sure that we really want to encourage legislative action on this issue.

b. Discussion: I think the salt can be disposed of at some cost. It occurs to me that financial incentives such as tax breaks could be used. The effect, to some extent, is to expand the supply thereby depreciating the value of an irrigation water right at the taxpayer's expense. It may be wiser to leave the deep saline ground water for a later time when the value justifies its use without tax incentives.

13. Question: As much as I am in favor of maintaining agriculture, doesn't the depreciation of the water right's value diminish the

farmer's ability to sell his water right like some other crop and thereby take some of his possible profit away? (III-1)

Discussion: The trade off, of course, is at the state level as opposed to the individual level. If we were to proceed with the incentives, then the state in essence would have the income and employment that results from two different sources. One would be agriculture with the income and employment derived from that enterprise. The other would be the development of the urban industrial and energy water uses. Those types of incentives at a state level always come at some cost to individuals as sole entities and the issue is the trade off over time.

STUDENT RESEARCH PAPERS

The Water Resources Research Insitute Symposium was pleased to host more than 130 high school students as part of the Albuquerque Public Schools Contemporary Issues in Science (CIIS) program. The students represented Albuquerque, El Dorado, Highland, Rio Grande and West Mesa high schools and the Career Enrichment Center.

The program is in its first year and is supported by the National Science Foundation. The interdisciplinary program introduces students to science issues that require skills in research, writing, problem analysis and decison making based on an understanding of the political and social factors involved in science.

The theme for this year's CIIS is "Water: Who Owns It?" Each CIIS student was required to write a research paper on some aspect of this theme. The research papers were to address the scientific, ethical/moral, social, political and economic issues relating to the theme. This year's program culminates with a student-run forum on "Water: Who Owns It?" to be held April 23 at the University of New Mexico.

The research papers presented here are representative of the CIIS students' understanding of New Mexico's water resources. The papers are presented basically as written by the student authors. We only wish space would have allowed us to include more student papers.

Special appreciation should go to Mary Ann Esquibel, district science coordinator for the Albuquerque Public Schools, for coordinating the students' participation at the symposium and to Dr. David Hsi, Albuquerque Public School Board member, for bringing this program to our attention.

ACCESSIBILITY TO WATER

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Although the importance of water to life and civilization is well documented, the nature, sources, supplies, losses and uses of water are often little understood. The availability of this precious substance is not the only concern of the people of the world and, in particular, the population of New Mexico. Accessibility to water is frequently related to economics, water rights and the management of water allocation. The current and future water problems of New Mexico will be primarily associated with water rights and the proper management of water resources.

Historical Significance of Water

Civilization and Water

The development of civilization on earth is associated with accessibility to water. It is not a coincidence that the earliest civilizations were located near rivers--the site of Sumeria was between the Tigris and the Euphrates, the Indus civilization was along the Indus River, and the Egyptian civilization was on the Nile River. A review of our own country shows the same association between water and the development of cities such as New York, Boston, Philadelphia, Miami, Clevland, Detroit, St. Louis, New Orleans, San Francisco and Los Angeles. Our cities grew alongside water either in the form of oceans, lakes, or rivers.

Some 2,500 years ago, Miletus, the father of Greek philosophy, founded his school of thought on the basic premise that "all things are water." Water was considered a basic, indestructible element in the universe. It was not until 1783, when Henry Cavendish synthesized the water molecule, that it became clear that the substance is actually a compound. The importance of water has not diminished since the eighteenth century.

Water is essential to life and the development of civilization. It is the substance that makes earth unique among the planets.

Hydrologic Cycle

Approximately 70 percent of the earth is composed of water. The oceans contain 97 percent of the water and glaciers about two percent. Lakes, streams and rivers contain only one percent of the water with underground reservoirs containing one third of the total. The total amount of the earth's water varies slightly due to what is known as the hydrologic cycle. Water evaporates from the sea and land and is drawn back into the atmosphere. It then falls as rain or snow, sinks into the earth to reappear as a watercourse. It is then drained back into the sea where it starts the process again. On the average, all the water in the air falls and is subsequently replaced every 12 days. This cycle is as old as our solar system.

Descriptive Properties of Water

Chemical Composition

An understanding of the hydrologic cycle requires some knowledge of the properties and chemistry of water. Water is the only substance on earth that is naturally present in three different forms: as a liquid, as a solid (ice) and as a gas (vapor). The conversion of water into these three forms is dependent upon varying degrees of temperature and the chemical makeup of the water molecule. Hydrogen and oxygen in a combination of two hydrogen atoms to one oxygen atom (H_2O) is the makeup of water. Hydrogen and oxygen have so great an affinity for each other that, given the slightest nudge, they come together violently, forming water and releasing great quantities of energy. Water's unique characteristics are a result of the bonds that hold the two elements together. They fit so perfectly that water is one of nature's most stable compounds. On the other hand, it takes a great deal of energy to split water into its components and that can only be done by powerful chemical or electrical energy. These connections are called bonds.

Chemical Bonds

Forces that hold two hydrogen atoms and one oxygen atom together in a water molecule are called chemical bonds. Each hydrogen atom has one electron whirling in orbit around its nucleus, but each of these atoms has room for two electrons. The oxygen atom has six electrons in its outer orbit, but has room for eight. The hydrogen and oxygen fill the empty spaces by sharing electrons. The two electrons from hydrogen enter the orbit of the oxygen atom and two electrons of the oxygen fill the empty spaces of the hydrogen, resulting in an extremely tight structure.

Hydrogen Bonds

The forces which link water molecules together are called hydrogen bonds. The hydrogen end of the water molecule has a positive electric charge; the opposite end has a negative charge. Water molecules link together because opposite charges attract.

Evaporation

When water is heated, the pace of the molecules increases, breaking their hydrogen bonds. They fly off as a gas (vapor) and this is called evaporation.

Precipitation

The condensation of water vapor under varying degrees of temperature converts the water vapor either to a liquid (rain) or to a solid (snow) form.

Capillary Action

The hydrogen bonds create a surface tension in a body of water which enables the water under certain conditions to creep uphill. Bound to each other in about every direction, they also bind to other substances such as clay, rock, soil or glass. Any solid that has oxygen in it will attract the hydrogen in water. When the molecules at the edge of the body of water reach for and adhere to the solid, they haul the rest of the water chain along with them. The surface, in turn, pulls the entire body of water to a new level and this process ends ony when the downward pull of gravity is too great to overcome. Without this characteristic of water, the flow of nutrients to plants and trees would remain in the soil.

Transpiration

Transpiration is the giving off of moisture through the surface of leaves or other parts of plant life.

Interrelationship of Evaporation and Precipitation

Evaporation and transpiration account for water loss of some 124,000 cubic miles per year, which is returned by precipitation. The precipitation is distributed with 26,000 cubic miles falling on land surfaces and 98,000 cubic miles falling on ocean surfaces. The continents receive more precipitation than they lose through evaporation. The excess flows to the sea and is called runoff. Where precipitation is great and evaporation is small, as in certain parts of South America or our own country, the runoff is great. The forms of the runoff are surface water, where it flows exposed; soil water, where it is held in the soil a few feet from the ground surface; and ground water, where it is held beneath the surface on bedrock.

A less well-known reservoir of water is ground water, which deserves special comment. Gravity attracts the precipitation from the skies, pulls it beneath the surface of the ground, distributes it among permeable layers and influences the direction it will flow. Water seeps downward toward the center of the earth until blocked at some depth by nonporous rocks where it spreads through the permeable earth. The earth's surface is underlain with porous rock such as sandstone and limestone. Beneath this is impermeable bedrock. All layers above the bedrock hold ground water. The saturated zone is called an aquifer and the top of the zone is called the water table. Cities often obtain underground water by drilling wells below the water table and pumping up the water.

Fresh Water

Of the world's total supply of water, only about two thirds of one percent is fresh water. The water cycle is perpetually purified by sunlight (heat) sweeping the oceans and surface waters and pulling up clusters of H_2O that make fresh water. Flowing water involves a self-purification process. Fresh water has the ability to absorb wastes and

transform them into harmless substances and thus cleanse itself. The motion of the water stirs up the waste matter, dissolving some of it or breaking the wastes into particles which either settle to the bottom or are diluted to harmlessness by incoming fresh water. In addition, a river or lake also metabolizes wastes, just as a living organism does. The river or lake absorbs oxygen from the air and from water plants which release it during the process of photosynthesis. The dissolved oxygen may act on organic wastes directly by oxidation. In effect, the waste matter is burned chemically so that nothing remains except carbon dioxide, water and a little ash. However, water can become too rich in nutrients, causing deterioration of water quality and preventing the water from purifying itself. This is called eutrophication.

Water Loss

In addition to consumptive use of water, there are water losses due to other causes such as evaporation, transpiration and contamination.

Evaporation

Each year, thousands of acre-feet of water are lost to evaporation from its storage reservoirs plus surface waters. An acre-foot of water equals 325,851 gallons of water. A characteristic example of the significance of evaporation is the evaporation of Lake Mead. Each year, five and one-half to seven and one-half inches of water evaporate over a 247 square-mile area. With the exception of the Colorado River, this is more water than flows through the entire state of Arizona in a year. Chemists have developed a tasteless, harmless and long-lasting "skin" to place on water to prevent water evaporation.

Transpiration

All living things require water and this includes vegetation. Water use by plants is called transpiration. One inch of rainwater on an acre can produce 166 pounds of mesquite or 500 pounds of grass.

Contamination

The chemical quality of both surface and ground water varies greatly. The quality of water is influenced by the types of rock the water has contacted during its flow. In general, the quality of the water deteriorates downstream as it acquires soluble material. Erosion adds larger quantities of sediment to streams and the accumulation of sediment in

reservoirs reduces storage capacity. Waste products dumped into surface waters by municipalities and industry greatly contribute to the pollution. Sewage and detergents from cities, radioactive and other chemical wastes from industry, and herbicides and insecticides from agriculture, all create water loss due to contamination. Contaminated water is a menace to life and must be controlled by water treatment plants, waste disposal systems, desalination efforts, and legislation to control the contamination of water.

Water and New Mexico

Physical Characteristics of State

Broad plains, wide valleys and basins, high plateaus and steep mountains form the landscape of New Mexico. The altitude ranges from a little less than 3,000 feet in the southeastern part of the state to more than 13,000 feet in the mountains in the northcentral part. The altitude significantly influences the precipitation, the temperature, evaporation, vegetation and the availabiliy of water. There are few large streams. Annual precipitation ranges from eight inches along the lower Rio Grande and San Juan valleys to 30 inches in the mountains. The average annual temperature ranges from 60 degrees Fahrenheit in the valleys of the south, to 40 degrees Fahrenheit in the mountains of the north. Vegetation is varied and includes brush, cactus and grass at altitudes of less than 5,000 feet; pinon and juniper at 6,000 to 8,000 feet; pine, fir and spruce between 8,000 to 12,000 feet; and tundra above 12,000 feet. The availability of water is determined by physical environment.

Principal Sources of Water

New Mexico is a semi-arid state and does not contain large rivers. The principal streams that drain the broad plains of eastern New Mexico are the Cimarron, Canadian and Pecos rivers. The Rio Grande, San Juan and Gila rivers drain most of central and western New Mexico.

Surface Water

A major supplier of water to the Southwest, including New Mexico, is the 1,440 mile Colorado River. It draws its water from the melting snow peaks of the Rocky Mountains which drain into brooks, which form creeks,

which form streams, which join to form rivers. These rivers unite to form the Colorado. The Colorado serves some of the water needs of several states, including Colorado, Wyoming, Utah, Arizona, southern California and New Mexico. It is divided into an upper and lower basin and is diverted to meet out-of-basin demands. Basins are controlled pumping areas. A great deal of New Mexico water comes from, and is returned to, the Colorado. Four smaller state rivers--the Animas, La Plata, San Juan and the Gila--all flow into this major river. There are six major controlled pumping areas (basins) in the state: Rio Grande (largest), Colorado, Lower Colorado, Arkansas-White-Red River, Pecos and Texas Gulf. The largest renewable water supply in the Southwest is the Upper Colorado.

Ground Water

In addition to surface waters, New Mexico draws its water from underground water supplies or aquifers. The volcanic rocks of the state are not good aquifers and rock formations vary greatly in the state. Aquifers vary in depth from hundreds of feet in one area to shallow beds in others. Most New Mexico water beds are less than 500 feet beneath the surface. Until 1931, underground waters were not controlled as were surface waters. By 1963, a total of 19 underground water basins in the state were declared by the State Engineer. Rural areas use ground water at four times the rate of surface water.

New Mexico Water Supply

According to the State Engineer Office, there will be 3 million acre-feet of water available annually in New Mexico over the next 40 years. Given expected population increases, approximately 3.3 million acre-feet of water will be needed. In some areas of the state, people are already fighting for water. In Bayard, an ordinance was passed rationing water with punishments of 30 days in jail for three offenses. Gallup is completely dependent upon ground water and residents are having to conserve. The greatest supply of surface water is in the northern part of the state. In large parts of the state, fresh ground water is scarce and in other parts, it is abundant. There are 2.3 billion acre-feet of fresh ground water beneath the Rio Grande north of Elephant Butte. This is more water than flows out of the Mississippi River in five years.

Albuquerque has the greatest supply of water in the Southwest. However, the mining of water in Albuquerque is forbidden. Accessibility to water has both geographical and legal limitations.

Water Distribution

The state of New Mexico probably will not get any more water than it is already receiving. It is questionable as to whether this will be enough. However, it appears that there will be sufficient availability of water as a result of various interstate compacts and the abundance of water associated with the Rio Grande. Much of the water used for irrigation, mining, industry and to supply New Mexico cities comes from the Colorado River. The problem is that New Mexico's supply of water is unevenly distributed. The greatest demand for water is in southern New Mexico where there is a long growing season and there are great areas of farmland. An artesian well lying on top of one of the most consecutive "recharging" water basins in the world is located near Roswell. The problem is that it is very costly to pump the water because it is so far below the surface. High Plains cities such as Portales, Clovis and Hobbs will receive water from the Ute Reservoir on the Canadian River. Other cities like Santa Fe and Las Cruces draw fresh ground water from the Rio Grande. At the present rate of pumping, Albuquerque will not run out of water.

Water Use

Water is used for irrigation, industry, power, transportation, recreation and for personal and municipal uses. The use of water for irrigation in the West is greater than in the East. The greatest expansion of irrigation in New Mexico started in 1941. In 1964, there were a million acres of irrigated land in the state. Of that, 335,000 acres were irrigated from surface water; 524,000 acres from ground water and 141,000 acres from a combination of surface and ground water. Irrigation in New Mexico accounts for 90 percent of the water usage. Our state engineer has stated that a 10 percent reduction in irrigation use could double the municipal-industrial use. Also, mining requires huge quantities of water, much of which is wasted. Coal mining in the state uses 45,600 acre-feet of water annually, much of it fresh ground water. The utility companies use 49,000 acre-feet of water per year. Cities can only draw

water from two sources: rivers/lakes and from ground water reservoirs. Cities with less than 5,000 population usually draw from ground water. In the Rio Grande area in 1970, public use of water was 3 billion gallons per day, industrial usage was 2 billion gallons per day and irrigation usage was 1 billion gallons per day.

New Mexico Water Problems

Legal Limitations

Interstate Agreements. Interstate compacts regulate deliveries of water to and from New Mexico on most of the major streams. These compacts include the Colorado River (1922), La Plata River (1922), Rio Grande (1938), Costella Creek (1944), Upper Colorado River (1948), and Canadian River (1950). As mentioned earlier, in 1931, ground water came under control like surface water. The amount of water New Mexico can consume from the Rio Grande is limited by the Rio Grande Compact, which was signed by New Mexico, Texas and Colorado in 1938. In addition to surface water, this compact controls the use of ground water in the Rio Grande Basin since there is a direct connection between the use of ground water and the surface river. Water pumped from the ground is assumed to lower the river in time. Although there are millions of acre-feet of ground water accessible to Albuquerque, the city is only allocated 65,000 acre-feet per year. The city only uses 69 percent of its allocation because it pumps water back into the river. It can be seen that the physical availability of water is a different issue from the legal availability of water. The Interstate Stream Commission administers laws and regulations dealing with the use of interstate water.

Prior Appropriation. In the early history of New Mexico, Pueblo Indians maintained irrigation works to utilize flood waters from normally dry stream beds. The Spanish conquest of New Mexico in the early 1600s led to the construction of irrigation ditches and the digging of shallow wells. Most of the water used in the state before 1900 was from the diversion of streams. The need for ground water supplies occurred when the surface water supply could not meet the demand. When the Spanish made land grants to the Indians and others, water rights were given with

the land. As Anglos moved into the state, they introduced mining and ranching, which increased the demand for water. In 1922, the Supreme Court decided on a doctrine of "prior appropriation" which determined that a state which could use the water immediately could have first priority for the water. This is why the state of California uses most of the water from the Colorado River. The "prior appropriation" doctrine is different from eastern practices where closer proximity to the water produced a higher claim to it.

Public Ownership. In the state of New Mexico, water is publicly owned and the right to use the water can be bought and sold but only when the water is put to a "beneficial use." The transfer of water rights is obtained after receiving a permit from the state engineer. Water right ownership, and therefore the right to sell, is dependent on six factors:

1. the water right is recognized by a state authority;
2. the ground water is legally a part of the land;
3. ownership of stock in a mutual water company;
4. payment of dues to a public irrigation or conservation district;
5. ownership of a lease signed by a federal agency administering a reservoir or water system; and
6. ownership of a lease agreed to by another party which itself holds a perpetual right or some other valid claim to the water.

Beneficial Use. The concept of "beneficial use" is not without its problems. For example, uranium ore in New Mexico lies, for the most part, in the most important body of fresh ground water in the northwestern part of the state. Water is pumped out of the mines and dumped into gullies or evaporation ponds. As long as the mines do not put the water to "beneficial use," they do not need a state permit to take it from the ground nor do they have to prove they are not hurting anyone. Meanwhile, Gallup struggles to find water for a growing population. If the mines sold the water to Gallup, it would be considered "beneficial use" and would, therefore, require a permit. A permit would not be issued unless

it was proved that taking the water would not harm existing water rights. Legislative efforts to require the mines to put the water to "beneficial use" have failed.

Water Allocations. Another problem has to do with the water allocations to certain areas. While some parts of the state are locked in a life-or-death battle for water, other regions cannot use all the water they get. For example, coal mining and power production have been allocated 100,000 acre-feet of water from the San Juan Basin but can only use 27,000 acre-feet.

Excessive Water Demands. There are so many laws, regulations and interstate compacts that the situation is, at best, confusing and at worst, dangerous. The Colorado River is overburdened and over-appropriated. There are more paper rights to the water than the river has water. According to the Department of the Interior, all the Colorado River states except Wyoming could have water shortages by the year 2000.

Competition for Water. The energy shortage of 1973 created a national incentive for looking at alternative energy sources such as coal. This was particularly true for the Southwest and the search added to the demand for water. Municipal, farming and mining interests will be fighting for water. How the water will be distributed remains to be seen. The state engineer who manages the majority of water laws and regulations believes that economics will resolve some of the disputes. The economic market for water rights will regulate the price and the demand for water. When water prices are to the liking of the farmers, they will sell their water rights. Water will be bought away from agriculture by municipal and industrial interests because they will be able to pay more for it. Although the law of supply and demand controls much of our state and national activity, it does not necessarily follow that decisions based only on economics will be in the best interest of either.

Other Claimants. In addition to the agricultural, mining, municipal and other industrial interests, there are other claimants to water. Various Indian tribes claim that water rights were part of the reservation land allocated to them by the federal government and, besides, they were the first occupants of the land. The Bureau of Indian Affairs has responsibility for protecting these rights. This responsibility requires

federal intervention on behalf of the Indians. The federal government also has national commitments it must consider. National energy needs involve the federal government as it attempts to determine national resources and plan for energy development. Any activity directed toward changing the use of the land has the potential for affecting water rights. Finally, the federal government has often funded most of the various state water projects. Although the current administration is attempting to have the state pay a greater share, the financial involvement of the federal government will require its continued interest.

Jurisdictional Disputes. A major problem related to water in New Mexico and other states is that legally valid property rights have been recognized by different jurisdictions: federal and state agencies. Federal courts have decided that Indian reservation land carried with it a right to water even when it is not being applied to "beneficial use." The state legal system was based on the concept of prior appropriation, which allowed citizens to obtain water rights if the water were put to "beneficial use" as defined by state law. In addition, efforts by federal agencies to build dams, reservoirs and diversion projects in arid regions made it possible for non-Indians to obtain water, some of which was subject to Indian reserved rights. Indians are increasingly asserting their rights to use the water on their lands in ways that conflict with state administration. The problem is that neither the state nor the Indians have the authority to settle water disputes that cross jurisdictional lines. The federal government has not exercised its authority consistently, which has added to the problems.

Conclusion

Accessibility to water has played an essential part in the development of civilization, including the development of our own cities. The hydrologic cycle guarantees sufficient water, providing it is not misused or abused through waste and contamination. Although a semi-arid land, New Mexico has sufficient water for current use and probably a sufficient supply to meet expected population increase by the turn of the century. Some areas of the state will experience high economic costs when pumping

is difficult or when contamination requires costly purification. Nevertheless, on the whole, state needs will be met if farming, industrial, mining and municipal interests can be reconciled with available water supplies and Indian water rights. To accomplish this, it will probably be necessary for the federal government to exercise its authority.

THE INSTITUTIONAL CONTROL OF WATER

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To obtain an acceptable quality of life, society must provide its people 30 cubic meters of water per person per year for direct consumption. Of those 30 cubic meters, less than one cubic meter is used for drinking. Residents in the southwestern Malagasy Republic survive on less than 2 cubic meters of water per person per year. They also pay $20 per cubic meter of water per person per year. In contrast, each American consumes 180 cubic meters of water a year at a cost of 25 cents per cubic meter.

In the United States, because so much water is consumed, theoretically there should be a set of efficient water laws. Unfortunately, this is not so. There are many aspects of water legislation. In fact, the issue of water law has become a "hot topic." Water law varies from state to state, creating interstate water lawsuits.

It is the purpose of this paper to concentrate on the various elements of water control, but especially the "institutional control of water." It will discuss the scientific, economic and political aspects of water control. It will also touch upon the social implications and the ethical/moral aspects of the institutional control of water. After all of the information has been presented, it will be decided if the current system of water control is good enough.

The Scientific Keys to the Control of Water

There are many different scientific aspects of the institutional control of water. This chapter, however, will center on only two aspects. It will center on how the "decision-making" groups are staffed and on how possible changes in the climate might occur due to changes in the amount of water available to the public.

"New Mexico has been unusually well represented in the Congress by men acutely aware of the status water needs," according to New Mexico

State Engineer Steve Reynolds. In New Mexico, the Office of the State Engineer was created by the Legislature in 1907 to administer the surface water code. In 1931, New Mexico's Legislature empowered the state engineer to declare underground basins. The most important step taken by New Mexico's Legislature was to create an Interstate Stream Commission in 1935. The commission had the responsibility to make the basic decisions governing the water in New Mexico. The seven-member Interstate Stream Commission is made up of one member representing each of the six different districts and the state engineer.

Currently, New Mexico's state engineer is Steve Reynolds. The role of the state engineer has changed over the years. The state engineer is now the director of the Water Resources Division. There are also state engineer district offices in Albuquerque, Deming and Roswell.

There is one major change in the climate that would probably occur due to changes in the amount of water available. Some experts agree that if the water supply was diminishing in most of New Mexico, the desert would take over. Citizens in most of New Mexico rely greatly on what scarce water is available. Without a supply of fresh water, most of New Mexico would become unpopulated. New Mexicans would have to move because the crops would die, the sewage systems would not function properly, and people would suffer from dehydration. Most people could not survive a New Mexico summer without a constant supply of fresh water.

Social Implications in the Control of Water

Industry, as an institution, holds a strong interest in water. Water is used by industry for production, cleansing and cooling. If industry gains total control of water, people can be sure of some big changes.

One of the biggest changes that industry would introduce would involve the price of water. Currently in the United States, people pay from 10 to 25 cents per cubic meter of water. That price surely would rise.

There also would be more industrial wastewater. If industry controlled water, any attempts to protect the environment would not have to be heeded. If industry did control water, industry could do anything it pleased with the water.

Of all the institutional interest in water, one institution clearly stands out. This institution is agriculture. In fact, some people believe that agriculture deserves the first use of water.

The idea of agriculture having first use of water does make sense, considering how important agriculture is to the livelihood of human beings. On the other hand, some people have very strong objections to this idea.

Critics charge that giving one institution the first choice of water is "bad news." If the first use of water is going to be given away, why choose agriculture? Why not give the first choice to industry or domestic uses? The critics believe that because there is no fair way to decide, no group should receive first choice.

There are many considerations that should go into the allocation of water. What the water will accomplish is probably the foremost consideration. Undoubtedly, the water should go where it is most needed. However, this is not what usually happens. In most instances, water will go to whomever can pay the most money. Water should go first to domestic uses such as drinking, cooking, washing and sanitation. Then water should go to agriculture, livestock, and lastly, to industry. Perhaps in the future, water allocation will not be such a large issue because there will be enough water.

The Political Aspects of Water Control

Until recently, the inadequacy of the United States government to recognize Indian rights has caused a lot of conflicts. In New Mexico, there are currently three major lawsuits involving Indian water rights. These lawsuits involve four Pueblo reservations on tributaries of the Rio Grande (U.S. vs. Aamodt); the Mescalero Apache tribe in the Pecos system in the sourthern part of the state (N.M. vs. Lewis); and the Navajo, Jicarilla Apache and Ute Mountain tribes on the San Juan River (N.M. vs. U.S.), which flows through New Mexico's major coal and uranium basins. Lastly, several other cases in the Rio Grande Basin have been filed in federal court. These cases will remain inactive until the Aamodt ruling is known.

If any one institution gains control of water, that institution gains a great deal of power. Water, being one of the most valuable of the

natural resources, brings power with ownership. This is especially true in the semi-arid West where people depend heavily on ground water for their livelihood.

When a person or institution gains power through water control, their power depends heavily on that water. For example, companies would not have to go by the usual safety standards, but would have to show extra care so as not to destroy the water source. So, even the power that comes with water must be used carefully, lest the water source, and therefore the power, is destroyed.

Currently, there is a major lawsuit between El Paso, Texas, and the state of New Mexico involving the export of some of New Mexico's water to the city of El Paso. The El Paso-New Mexico lawsuit is two years old. A new trial started on September 13, 1982, and was heard before Judge Howard Bratton.

New Mexico's witnesses testified that the New Mexico export ban is necessary to protect the "public health and welfare." In New Mexico, protecting the public's health and welfare means retaining enough water to provide employment and to keep agriculture sound. El Paso's definition entails only the public health that involves need for basic use such as drinking, cooking, sanitation and firefighting. El Paso and New Mexico have had considerable trouble because of this difference in terms.

Another problem between the two has involved the definition of the term "free market." New Mexico attorney Stephen Hubert stated that El Paso wants to grow using New Mexico's water. El Paso expects New Mexico to get by as a "third world" society using other resources. El Paso lawyer Harry Reasoner charged that New Mexico has no "policy reserving water for future use." Reasoner said that if El Paso loses the suit, New Mexico can put the water to immediate use. Therefore, New Mexico has a "free market" in water. "They just don't want the free market to include Texas," Reasoner said.

Some experts believe that the Sporhase decision is the final decision in the El Paso-New Mexico lawsuit. The Sporhase decision is the result of a recent Nebraska-Colorado lawsuit in which the Supreme Court ruled that water is an article of commerce. It was also ruled that it should be in the states' power to ban the export of water. If New Mexico does

lose the suit, there are laws the state can fall back on to protect its water.

At a water symposium on November 10, 1982, the question arose about why New Mexico objects to shipping its water to El Paso when offered good money. New Mexico objects to shipping water to El Paso because New Mexico has a statute that states no water may be legally shipped across the border. Also, New Mexico is having its water for growth taken away by El Paso. Even if New Mexico exports its water, it no longer is public property. El Paso's demand for water denies New Mexico a chance for growth. In this instance, the water no longer is available to the public and therefore no longer belongs to the public.

The Economics Involved in Water Control

The biggest questions about the control of water involve economics. Most of these questions aim towards the buying and selling of water. This chapter will attempt to answer some of those questions.

One of the most debated topics involves buying and selling water to the highest bidder. Proponents argue that selling water to the highest bidder will bring economic relief. Critics charge that buying might get out of hand and that millions of cubic meters would be bought at a time. This would speed up the water shortage and new companies would have no chance to buy.

If water goes up in price, how will in-home usage change? One of the more obvious results will be in the amount of water used. In the beginning, water usage basically will remain the same. Later, when water prices keep going up and up, use will be cut down considerably. For example, the use of water-luxury items will drop.

Still another hot spot is whether or not water should be bought or sold like any other commodity. Supporters say that buying and selling water will aid the recession. Opponents of the open market selling of water believe water should be treated differently. They believe that steep prices and limited selling will protect water.

In general, there are two institutions that would benefit from the buying and open selling of water--big business and the federal government. Big business wants as much money as it can get to continue production and still make a profit. If business had the ability to sell as

much water to the market as it wanted, it would greatly increase profits. The government is in economic trouble. Selling water on the open market would increase earnings and thus taxes. This would help the recovery from the recession.

What Ethical/Moral Responsibilities are Involved in Water Control?

The ethical aspects of the institutional control of water have been a topic of controversy for some time. The topic involves the question of, what would a political entity do if, after leasing or loaning water rights, unanticipated growth necessitated increased water use? This question is worth discussing. The answer would depend on the "political entity" in question. One type would do nothing and honor the agreement. Not many politicians who want reelection would do this. Another type would try to negotiate an answer agreeable to both parties. The last type of politician would take a "loan/lease be damned" approach and supply the needy community with water.

Communities really have no written responsibility to each other. Hopefully, community A would help community B, if B had a dire need of water. Other than the previous example, however, communities usually look out for themselves first.

Tom Bahr, director of the Office of Water Policy in the Interior Department said, "Until the price of water reflects scarcity, there will be no meaningful, long-term program." If people must wait until the price reflects the scarcity, there will be trouble. What responsibility does modern man have to future generations of water users? The point already has been made that people will wait until it is almost too late to accomplish anything to help future generations.

On the other hand, since 1955, about $1.4 billion of water projects have been planned, completed, or are under construction in New Mexico. Some of these projects are the Bureau of Reclamation's Navajo Dam and Reservoir at the cost of about $44 million; the Navajo Irrigation project at a cost of about $523 million; and the San Juan-Chama project at about $95 million. Other projects are the Hooker (or suitable alternative) unit of the central Arizona project for $108 million; the Animas-La Plata project for about $50 million allocatable to water users in New Mexico; Brantley Dam and Reservoir on the Pecos River above Carlsbad for about

$218 million; the Corps of Engineers' Middle Rio Grande project for flood and sediment control and water conservation at about $190 million; and the Los Esteros Dam and Reservoir on the Pecos for $40 million. Lastly, there are those projects of the Soil Conservation Service that come under the Small Watershed Protection and Flood Prevention Act at a cost of $58 million with $47 million completed. A person can take either view: That nothing real has been done, or that $1.4 billion has been spent to help the future generations of water users.

Conclusions

This report did not directly center on the actual control of water. Instead, many arguments were presented for and against many issues that do involve controlling water. The report has given evidence in five major factors of the institutional control of water: scientific, ethical/moral, social implications, political and economic.

Water control can be either beneficial or detrimental. In the hands of competent individuals, water control can work for the good of the community. On the other hand, water control, left unchecked, can grow to almost unimaginable proportions. It will take careful tending to make sure that water control in the United States doesn't turn sour.

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