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TO THE ASSOCIATION OF CALIFORNIA WATER AGENCIES
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CALIFORNIA'S WATER FUTURE

I was intrigued by the title of Senior Editor Rowe Findley's article in last month's National Geographic magazine. He called it "The Bittersweet Waters of the Lower Colorado." I think his use of the word "bittersweet" could well apply to many of our rivers throughout the Nation and particularly here in the Pacific Southwest.

Our water in recent years has indeed become both bitter and sweet. It is bitter through countless controversies--it is sweet because it is our lifeblood. Water supplies in most areas of the West have never been overly plentiful. And as the years slip past, we watch our overworked water supplies dwindle. New mouths show up daily at the water faucets and dinner tables to
compete for the remaining drops.

Long ago we completed our "easy" water projects which like "motherhood" had widespread support in those days. Today not only are water projects involved in controversy, but even motherhood is in disrepute among certain elements of our society. In times past it seemed that almost everyone was for water conservation and power-producing dams. The water engineers were looked up to and applauded. Today, we are tackling the "hard" projects which do not have wholehearted nor universal acceptance. How well you water leaders in California know this. You have had to battle every inch of the way to build the California State Water Project. Perhaps those who oppose water projects are honest and sincere in their opposition, yet the present day population would not be here if it were not for such great water projects as those along the lower Colorado River and major river basins within the State of California.

How times have changed! Mothers and engineers have fallen from grace with certain people—and you know who. Those who want no further water development blame technology for our current environmental ills. But let me say to them that without technology, man could not continue to exist and enjoy the great American way
of life which is the envy of the entire world. Technology combined with environmental sciences and control can meet present-day demands.

This technology has paid off extremely well here in California. You water leaders represent highly successful districts that keep water flowing through your pipes and canals. You Californians have not waited for water famine to strike. You have been years ahead in developing your water supplies. While eastern cities have rationed water, most California cities have had ample supplies—only because of your foresight. I'm sure California will not run out of water even if it becomes necessary to tow icebergs up from the Antarctic.

The Bureau of Reclamation takes great pride and satisfaction in being a part of your water past, present, and future. Only because of your support were we able to construct such great works as the Boulder Canyon and Central Valley Projects. We look forward to a continuation of this State-Federal teamwork in developing the remaining "hard" projects.

Writer Findley's use of the word "bitter" referred to the deteriorating quality of the Colorado River, as well as to its controversies. As you well know, the Colorado River is plagued with both quality and quantity problems on which the Bureau of Reclamation
and other agencies are now working.

Someday, the Colorado River water you use might contain desalted geothermal water. Currently two test desalting units are being operated experimentally at the site of the Bureau of Reclamation's two deep geothermal wells on East Mesa near Holtville. This desalting stage has been reached only three years after the Bureau of Reclamation became involved in geothermal research in Imperial Valley.

The Colorado River for centuries had spilled over into Imperial Valley, building a deep silt delta and saturating it with water. This water has simmered in the depths of the valley called the Salton Trough as a latent resource, awaiting release to serve mankind in various ways.

Each of the two small desalting units—a multi-stage flash and vertical tube evaporator—is capable of producing 50,000 gallons of water a day, reduced from in excess of 20,000 parts to 50 parts per million of dissolved solids. This quantity of water is only a "drop in the bucket" in relation to the overall Colorado River supply. But the research may open the way by which Colorado River water deposited beneath Valley Pond might be recycled to the
stream from which it came. And steam roaring from the subterranean basin could someday spin turbines connected to mighty electrical generators in this country as it is now doing in Mexico's Cerro Prieto plant.

Reclamation's geothermal program is now in the research and development stage. If preliminary feasibility is indicated, demonstration and large-scale production stages would be expected to follow. At this point we do not know for sure whether it is engineeringly or economically feasible to desalt large volumes of geothermal fluids.

Nevertheless we expect that feasibility will be found and we envision that high quality desalted geothermal water could be delivered to several points along the lower Colorado River—possibly as far north as Lake Mead behind Hoover Dam. That delivery point is the most costly but it offers the greatest benefits for storage and water quality control. This augmentation could increase the river's flow and help relieve the Colorado River basin states of the obligation to deliver water to satisfy the requirements of the Mexican Treaty as well as assist in relieving probable future water shortages.
Elsewhere, desalting appears destined to play a major role in Colorado River water quality. The Agreement embodied in Minute 242 to the Mexican Water Treaty of 1944 proposes a desalting plant as the principal feature to effect a permanent and definitive solution to the salinity problem on the lower river. Using either the reverse osmosis or electrodialysis process, the proposed plant would be capable of desalting up to 100-million-gallons-per-day or 108,000-acre-feet-per-year, reducing the content of the drainage flows from the Wellton-Mohawk area in Arizona from more than 3,000 parts to 240 parts per million of total dissolved solids.

Located near Yuma, the plant would be the world's largest--desalting almost twice as much as all of the desalting plants now operating in the United States. The Yuma plant could prove to be a technological breakthrough, opening up a new water supply for brackish water areas throughout the world.

The proposed solution also provides for lining the first 40 miles of the Coachella Cañal to save an estimated 132,000 acre-feet of water per year now lost through seepage. Currently, Colorado River storage water is used to make up Wellton-Mohawk drainage flows bypassed to the Gulf of California to improve the
quality of water delivered to Mexico. The water saved by lining the Coachella Canal would help compensate for the loss of the bypassed drainage water.

The plan for meeting the requirement of Minute 242, also includes facilities in addition to the desalting plant and Coachella Canal lining, and is titled "Colorado River International Salinity Control Project". Your should not confuse this with another program underway which promises water quality improvement within the Basin states titled "Colorado River Water Quality Improvement Program." That program has been the basis for bills now before the Congress, introduced jointly by 14 Senators and 35 Representatives from the basin states, that would authorize the Secretary of the Interior to execute a program of salinity control along the entire stretch of the Colorado River. These bills, titled "Colorado River Basin Salinity Control Act of 1973," would authorize construction of works to control saline flows from Laverkin Springs in the Lower Basin and from Paradox and Grand Valleys in the Upper Basin. Generally, the Act provides for investigation of the feasibility of constructing point and diverse source control projects, initiating management, conducting basinwide desalting activities, and determining the
effect of the these activities on the economics, ecology, and esthetics of the area.

The Colorado River's water quality and quantity might also be enhanced if we achieve the expected degree of succession the Bureau of Reclamation's weather modification pilot project in the San Juan Mountains of southwestern Colorado. There we are entering our fourth winter of seeding storms to develop technology for increasing the snowpack over mountain ranges. This program is a part of our overall weather modification project which we call "Project Skywater". It will probably require another year or longer to accumulate sound evidence that our weather modification technology is working.

We are encouraged that cloud seeding could be the key to adding 1 and 2 million acre-feet of water to the Upper Basin annually. And this quantity of almost pure water would most certainly have beneficial effect upon the Colorado River which California, along with the other basin states, would share.

Weather modification involves complicated technology and before it can be applied, the public must accept it. We are conducting detailed social and environmental studies which have been underway for the
past six years. This work has been contracted to several universities, prominent ecologists, and others. Results to date would support the conclusion that weather modification is safe and effective.

I know that many of you here today are interested in the proposed Santa Margarita Project. The Bureau of Reclamation worked with the Fallbrook Public Utility District and the Marine Corps Base at Camp Pendleton for many years in developing plans for that project.

Our investigations on the Santa Margarita River began 18 years ago. The Congress authorized construction of the project in 1954, subject, among other things, to a satisfactory settlement of water rights on the river. After long years of litigation, a settlement of these rights was reached five years ago when the District, the Secretary of the Navy, the Secretary of the Interior, and the U.S. Attorney General signed a "Memorandum of Understanding and Agreement," that would provide a physical solution to the problem.

A feasibility report on the Santa Margarita Project has been completed by the Bureau of Reclamation. However, the Department of the Navy and the Camp Pendleton Marine Corps Base no longer feel a sense of urgency toward this proposed development. Without their full support, it is impossible to move forward to implement the plan proposed in our feasibility report.
Now, for a moment, I would like to discuss one of California's thorniest water problems, the Peripheral Canal—who will build it; what is a reasonable timetable; how is Federal participation to be accomplished; and what obstacles will have to be overcome?

At the outset, I want to assure you that the Bureau of Reclamation favors the Peripheral Canal as the best means of solving the combined water management, water quality, and water export problems associated with the Delta. In my opinion, the canal is needed to maintain the integrity of both the State Water Project and the Federal Central Valley Project. It is equally vital to the Delta, if its environmental and ecological values are to be maintained and enhanced. The sooner the Peripheral Canal is constructed and put into proper operation to serve its many purposes, the better for all concerned.

Water from both the Central Valley Project and the State Water Project must be conveyed through the Peripheral Canal to meet efficiently the water needs of those projects and water must be released at key points from the Peripheral Canal if the environmental benefits to the Delta are to be realized efficiently and effectively.

Today's Delta is a manmade environment, largely maintained by Federal and State upstream waters, developed for use at points south of the Delta (which
must traverse the Delta). About 2 million acre-feet of water now passes through the Delta, via the Delta Cross Channel and other unregulated natural and man-made Delta channels, on its way south.

The Peripheral Canal will provide the necessary high degree of flexibility to protect and enhance the beneficial uses of water within the internal Delta as well as protect the quality of export supply. Water release capabilities at 11 locations along the canal, coupled with coordinated operation of upstream State and Federal storage reservoirs will provide a wide variety of seasonal flow and water quality patterns within the interior Delta to insure the necessary level of environmental quality control.

Recent operation studies conducted by the Department of Water Resources and the Bureau indicate that for water transport purposes, completion of the canal should be scheduled not later than 1980. However, fish and game interests are on record as wanting the Peripheral Canal constructed at the earliest possible date to prevent further possible deterioration and provide for enhancement of the Delta environment, particularly the world-famous fishery.

As you know, the State Department of Water Resources has authority to undertake construction of the Peripheral Canal either on its own as part of the State Water
Projects, or jointly with the Federal Government.

For its part, Reclamation completed a feasibility study on May 6, 1969, recommending construction of the canal and necessary pumping plants and other appurtenant works.

Since the Peripheral Canal in the end to be successful must be a cooperative State-Federal venture, and because of the economic advantages associated with a joint undertaking, I believe that early authorization of Bureau participation in the Peripheral Canal development, as a part of the Central Valley Project, should be vigorously pursued.

In order to achieve appropriate Federal participation in the Peripheral Canal, California interests must present a strong, united front. I recommend that your decision be followed by decisive action as soon as possible.

Now, I have reviewed the immediate or short-term problems and opportunities in California. I don't want to leave you, however, until I have laid out the more important long-term situation.

The major water problems of California have not yet been solved, and there will be problems for generations to come. We are reminded of this when we see the State turn from drought to flood in a matter of days. We see it, too, when we realize that northern California
is water-rich and southern California is greatly in need of an increased, stabilized water supply.

How rapidly and to what extent are Californians coming to grips with these long-range problems? What role if any, should the Bureau of Reclamation play? When and in what way will Californians make their wishes known at home and to national leaders? On whom will the leadership mantle fall in the future?

It is clear to me, and I know to many of you, that a great deal of thinking and long-range decision making is vital. With respect to one thing, I feel certain the Bureau of Reclamation will continue as a strong and vital force in land and water resource development, not only in this State but elsewhere in the West. The support of your leadership toward that end is already clearly evident through actions taken by your Congressional delegation and organizations such as yours.

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