

## TRENDS IN WATER PLANNING

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### Introduction

The major thrust of water planning for the next 20 to 40 years will be devising cost effective, acceptable management strategies and operational plans to make maximum feasible use of the facilities and supplies we now have. Costs of water projects are high and continue to increase. The best projects have already been built. Funding costly new projects will be difficult, perhaps impossible.

There are many opportunities to make better use of existing projects and supplies throughout the United States. Such opportunities exist with major federal projects. In California, the Federal Central Valley Project and State Water Project are operated conjunctively under a Coordinated Operation Agreement to solve certain common problems. The costs of better management for more effective use of existing projects and supplies, singly or in combination, will generally be far less than the historic approach of building new projects to solve each new problem as it arises, often by separate agencies.

### Planning for Management

To devise such management strategies will require innovative, creative thinking with, no doubt, major changes in our laws and institutions. We need new concepts of operational management and financial management, and of new institutions for joint action among agencies.

Existing agencies, federal, state and local, as well as the private sector with diverse interests will be involved. These interests must be harmonized and integrated for the greater overall good. It is difficult to harmonize separate interests by taking something from some for the benefit of others although in some cases that may be necessary. The better solution, however, is to devise a management strategy that

provides "a little candy for everyone." Those whose interests might be harmed must be compensated in some manner as part of the strategy.

An effective management strategy may impact some of our long held, deeply cherished beliefs concerning the sanctity of individual water rights. To comply with some recent court decisions, major changes in thinking and institutional structures will be required. Major changes in statutes have already occurred here in New Mexico. This evolution will require a much greater understanding of our interdependencies and interrelationships in hydrology and hydraulics as well as institutional structures and activities. Development and uses of ground water should be operationally integrated with development and uses of surface waters to maximize cost effectiveness. Often, a regional approach should be taken for maximum effectiveness.

I am led to these conclusions by observation, by my experience as the former director of Water Resources in California and as a consultant for the past 25 years to major public federal and water agencies in several states, and to some foreign governments. My conclusions also rest upon my analysis of current trends and the political realities as they exist today and as they appear to be heading in the future. Planning must take these trends and realities into account if the plans are to be implemented.

#### Trends

One pronounced trend is toward a greatly diminished role of federal government in funding, construction and other activities in the water resources field, except in the regulatory aspects. The federal policy now is to require major cost sharing and repayment, particularly up front funding for proposed federal projects. State and local agencies are moving to fill the vacuum created by the diminished roles of the federal agencies. But those entities also have pronounced funding difficulties and funding limitations because of the manifold demands upon the tax dollar and other sources of revenue.

The range of uses to be considered in allocating water has become much broader than just a few years ago when domestic and irrigation uses

were the principal considerations. For example, in-stream uses and environmental protection have become major considerations in the water resources allocation process. California statutes have recognized recreation and enhancement of fish and wildlife as primary functions of state water projects for nearly 30 years. Nebraska's recently adopted water policy emphasizes in-stream uses as in other states. Water rights for in-stream uses have been granted in Nevada.

There is definitely a trend toward control over the development and use of ground water at the state and local levels, possibly through a permitting process. Arizona is the outstanding example.

It appears that there may be little need for new areas to be brought under irrigation. This is due in large measure to loss of foreign markets for American agricultural products. These markets may never be regained.

A most significant trend is the increasing controversy and political dissensions concerning water. Political dissension in California has held up any significant new water projects in that state for 15 years or more, and shows little sign of abating. Controversy and dissension will increase with the ever increasing pressure on our water resources and the escalating costs of projects.

One trend of major significance is the increasing tendency to rely on the courts to resolve water resource allocation problems. Court decisions often establish new water policy. This trend is sometimes bad, sometimes good, depending on which side of the litigation one happens to be. To illustrate the point, one need only mention the Sporhase<sup>1</sup> decision that water is an article of interstate commerce and that state ownership of ground water is a "legal fiction." Another case, the Audubon<sup>2</sup> decision in California, broadened the scope of application of the public trust doctrine. That doctrine has been interpreted by the State Water Resources Control Board in California as giving the board the power to review any water right to see if it impacts on the public trust, and to revise or revoke the right as necessary to protect the public trust. Finally, there is a Superior Court decision in California which

would require comprehensive adjudication of all water rights in the great Central Valley. It is impossible to estimate how many water rights might be involved or how many years such an adjudication might take and at what cost. Fortunately, that case is on appeal.

#### Innovative Approaches

To illustrate some of the concepts in planning and management strategy, I will briefly discuss a plan in California that is in the development stage. This involves the Metropolitan Water District of Southern California (MWD), the major water service contractor under the State Water Project, and MWD's proposal to use ground water storage in the Chino Basin in Southern California to augment the yield of State Water Project. There are about 7 million acre-feet of useable underground storage in Chino Basin.

The State Water Project, as some of the audience may know, conserves water in Northern California at Lake Oroville on the Feather River about 100 miles north of Sacramento. The conserved water is released from Oroville to flow down the Feather River to the Sacramento River and on into the Sacramento-San Joaquin Delta, generating hydroelectric energy and serving in-stream uses and irrigation on the way. The released water is rediverted and unregulated flow is diverted from the delta to serve irrigation and cities in the Central Valley, and the urban areas in the San Francisco Bay region and in Southern California. Major offstream storage downstream from the Delta filled by pumping is provided to conserve excess unregulated flows in the Delta not needed for immediate use. The offstream storage reservoir, San Luis, and about 100 miles of the aqueduct system were financed and are used jointly by the state and the U.S. Bureau of Reclamation.

MWD is the primary water importing agency for the urban areas in Los Angeles, Orange, and San Diego counties, and major areas in San Bernadino, Riverside and Ventura counties. All told, MWD serves some 9 million people, selling water wholesale to its member agencies through an extensive distribution system.

MWD's water supply contract with the state calls for a full delivery of slightly more than 2 million-acre feet of water annually on a firm basis. But, because of the political controversies between Northern and Southern California, the state has not been able to build the additional conservation works in Northern California that were contemplated at the time the contract was negotiated, and with the present facilities, will not be able to fulfill that contractual commitment to MWD on schedule. So, MWD is taking steps to make use of surplus state water that is available from time to time in wet years. MWD will develop and utilize underground storage in Chino Basin for storage of the surplus water available to it not immediately needed for direct use. The surplus water will be added or recharged directly to underground storage by surface spending and injection, and indirectly by supplying municipal agencies now pumping ground water with treated surface water in lieu of pumping at times of surplus availability.

MWD will extract the stored water as needed in dry periods for the benefit of MWD's member agencies when the State Water Project is short. That sounds simple, but the institutional, financial and legal arrangements with the local Chino Basin agencies are complicated. For example, water rights in Chino Basin have been adjudicated and must be recognized and protected in the agreements. There are other complications but all are being worked out.

The indirect storage aspects of this MWD program need a bit more explanation. The Chino Basin underlies an urban area with a number of municipal water purveyors including the cities of Chino, Upland and Ontario. As noted above, the ground water rights in Chino Basin have been adjudicated under a stipulated judgement administered by the Chino Basin watermaster. The cities now pump ground water under their adjudicated rights and pump additional water to meet their demands, which is replenished by Chino Basin Municipal Water Agency, a member agency of MWD, with MWD water under its entitlement. Under the indirect storage concept, it is proposed that when surplus State Water Project water is available in wet years, the urban water supply agencies cease pumping

from ground water and be supplied with treated surface water directly into their distribution systems. The proposal includes building a pipeline from MWD's Weymouth treatment plant to the area. When a period of deficiency occurs, these entities will again pump ground water, while MWD uses the water it has stored. They will not lose their basic ground water rights, even though they may not pump for 10 or more years. The complexities of negotiating mutually acceptable contractual arrangements, including financial, with the multiplicity of agencies involved, are obvious.

The cost of the increase in yield to MWD, which may aggregate up to 100,000 acre-feet per year, will be much less than from a new water project in Northern California, perhaps half as expensive. Those agencies that enter into exchange agreements with MWD will benefit from higher ground water levels as well as being supplied directly with treated surface water much of the time. There will be financial advantages to all concerned from this regional approach.

This is, in my opinion, an outstanding example of cost effective management of ground water in conjunction with limited surface supplies, not just for the benefit of the area overlying Chino Basin but for all the member agencies of MWD in Southern California. The water extracted from that previously stored will be part of MWD's total supply.

This multi-agency, regional approach to the solution of common water problem is, I believe, an outstanding example of the concept of conjunctive management of limited surface supplies with ground water to serve an extended area. The investment required for new facilities will be relatively minor compared to the cost of a new dam and reservoir in Northern California to develop the same amount of new yield for the same area. This isn't to say that new conservation works in Northern California will not be required at some future time. However, new works are now politically infeasible and may remain so for some years. Even with additional dams and reservoirs, conjunctive use of surface and ground water as envisioned will continue to be an essential and cost effective component of the regional supply.

The well publicized arrangements being worked out between MWD and Imperial Irrigation District (IID) are an example of an innovative approach to making more effective use of existing supplies and facilities on a regional basis. It is proposed that MWD pay IID \$10 million per year for which IID will improve its irrigation systems by lining irrigation canals, by collecting and reusing tail water and other measures, to make efficient use of its supply and reduce the amount of water now flowing to the Salton Sea from the irrigation system. The amount of initial reduction is estimated at 100,000 acre-feet per year and could increase to as much as 250,000 acre-feet annually. The conserved water will not be diverted by IID from the Colorado River in which IID has prior rights dating back many years. Rather it will be diverted upstream by MWD and conveyed to Southern California for municipal and industrial uses through its existing aqueduct system.

There will be no transfer of water rights. Imperial Irrigation District will continue to have its full rights in and to the water of the Colorado River available if and when needed.

An interesting aspect is the impact on third-party interests. The level of Salton Sea has been rising for many years, adversely affecting properties and developments around the periphery of the sea. Reduction in the inflow will slow the rate of rise and hasten the time when the water level will stabilize. Stability will have a beneficial effect. Conversely, the reduction in inflow of relatively fresh water will increase the rate of salinity buildup in the waters of the Salton Sea, which is already more saline than ocean water. This buildup will shorten the time before the salinity becomes so concentrated that it is no longer tolerable by the currently important sport fishing industry.

Other examples of transfers of water rights and water supplies to different types of use at different locations that have already been consummated or are being considered could be cited. Transfers appear to be a definite trend. However, before such transfers are approved, full consideration must be given to the hydrologic, environmental and social impacts of the proposed transfer and to the third-party interests in the

water involved. In most, if not all transfers, there will be such impacts and third-party interests. It cannot be considered as a single transaction between a "willing seller and a willing buyer" as some of the more ardent proponents of transfer are prone to think. Transfers should be carefully controlled by the state after a full investigation as to the possible effects and a public hearing. Water must not be considered as a "free good" to be used and abused at will. It is important to all and should be administered with full regard to the public interest.

#### The Future

To summarize, future water resources planning must:

- 0 Give careful consideration to means of achieving more effective use of existing facilities and supplies;
- 0 Provide better management and protection of ground water. Conjunctive use of ground and surface supplies will be increasingly important;
- 0 Propose measures that will provide incentives for more efficient uses of water;
- 0 Consider multi-agency, regional approaches;
- 0 Develop new management concepts, for example management agreements or compacts among all those interested in a particular water resource;
- 0 Devise new approaches to funding management activities. In this regard, thought should be given to levying assessments on existing and future economic uses of water, both surface and ground, to provide the monies necessary for management and for construction of needed new projects;
- 0 Provide for transfers of water rights and supplies with full regard to hydrologic, environmental and social impacts, and protection of third party interests, sometimes termed externalities;
- 0 Give full consideration to in-stream uses and environmental impact; and
- 0 Consider the broad public interest or public welfare in the allocation of water resources.



And finally, I want to submit a controversial thought for possible consideration by future New Mexico Annual Water Conferences. I believe that water rights should be reviewed periodically, say at not greater than ten-year intervals, to determine the reasonableness of current use under each right and to take advantage of new developments and technological improvements for more efficient use. This review is essential to make the most effective use of increasingly scarce and costly water supplies.

We must accept the fact that all projections of future supplies and demand and plans made based on such projections are fraught with uncertainty. We must be willing to accept some degree of risk unless we want to pay exorbitantly to minimize the risk of future shortage. The future question will be -- how much are we willing to pay to avoid shortage?

END NOTES

- 1 Sporhase v. Nebraska; 458 U.S. 941 (1982)
- 2 National Audubon Society v. Superior Court; 658 P 2d 709 (Cal.),  
cert. denied, 104 S. Ct. 413 (1983).