

State policy developments in water reclamation

Jean Auer

Water reclamation, considered by many to be the neglected stepchild in water resources planning, is about to come into its own with recent passage by the State Water Resources Control Board of a "Policy and Action Plan for Water Reclamation in California."

Even though statewide agriculture now uses reclaimed water to grow more than 20 different crops ranging from artichokes to alfalfa, and some agricultural uses date back to as early as 1945, use of reclaimed water has never played more than a small part in California's total water supply picture.

That is about to change. Given the state's projected water shortages—even without the drought, which is now in its second year—and the amount of wastewater that is being highly treated and then wasted by discharging it into the ocean or some other saline body of water, it is obvious that greater use must be made of this potential source of water supply.

The "Policy and Action Plan" is designed to achieve this. The plan, developed with the assistance of a 55-member task force representing state and federal agencies and the public:

- Requires that basinwide studies be made to identify potential reclamation projects.

- Amends the regulations governing the Clean Water Grant Program administered by the State Board so that, in the competition for funds, reclamation will be given a higher priority.

- Amends water rights regulations to ensure that use of reclaimed water as an alternative source of water supply is fully examined in any new applications for water rights or petitions to change existing water rights.

- Recommends changes in water rights laws that will protect existing rights when reclaimed water is used in place of fresh water. (Under existing law, some water rights are lost if they are not used.)

- Identifies a research and demonstration program to evaluate health concerns and environmental impacts and to assess the statewide market for reclaimed water.

The Board is also considering other alternative legislative proposals including: (1) authorization to require water supply agencies to assess and report on reclamation potential; and (2) authoriza-

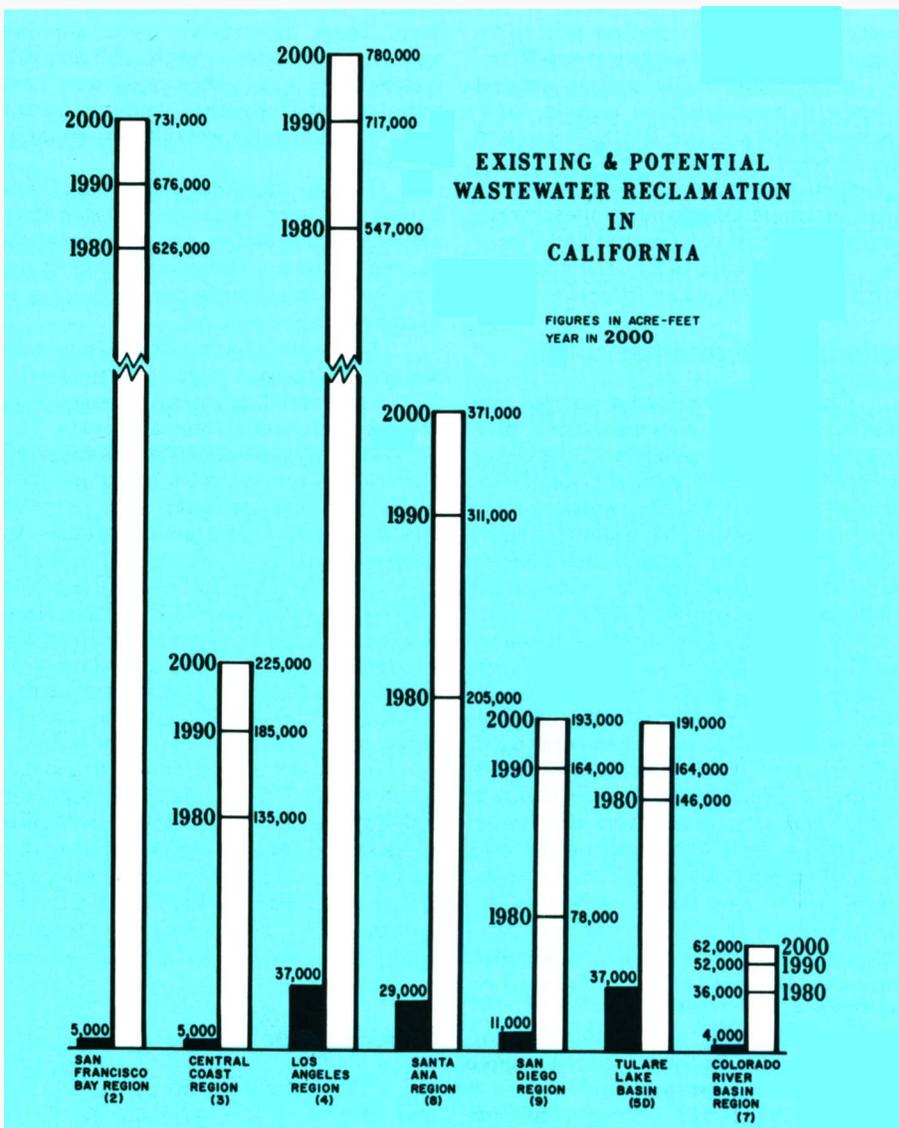
Water needs

Behind the Board's decision to make a strong move at this time to implement its legislative mandate to "... encourage development of water reclamation facilities ..." are some startling statistics.

Californians now require some 31 million acre-feet of fresh water a year for all purposes: municipal, industrial, and agricultural. About 2.8 million acre-feet of this—approximately 91 million gallons—are obtained by overdrafting ground waters or by purchasing water

from other areas that eventually may need the water now being exported. By the year 2000, this annual excess demand is expected to increase to 4.6 million acre-feet. The North Coast rivers, protected by wild and scenic river designation, remain the only untapped fresh water source of any magnitude in the state.

In 1975, Californians produced about 3.1 million acre-feet of treated municipal and industrial wastewater. This is likely to increase to 4.7 million acre-feet by the year 2000. Although not all of this will be reclaimable, because of high total dissolved solids or some other constituents, about 3.2 million acre-feet could be reclaimed—and, of that amount, approximately 80 percent is a potential new source of water supply. (These figures represent an estimate of reclama-



The black areas show the amount of water currently being reclaimed and reused in the areas of the state where the greatest potential for reclamation exists. The open bars show the amounts of water that will be available to reclaim and reuse between now and the year 2000. If not reclaimed and reused, much of this water, which still must receive secondary treatment to comply with federal standards, will be wasted to the ocean or other saline body of water.

tion potential and do not consider detailed economic and technical constraints.)

In addition to these water-use and wastewater production statistics, there are cost considerations. Through the Clean Water Grant Program, billions of dollars will be spent over the next decade to meet state and federal water quality standards. In fact, a State Board survey shows that California needs to build \$5 billion worth of sewage treatment facilities just to meet the needs of its projected population in 1990. With this much money going into secondary treatment facilities, and with the urgent need for additional water supplies, it makes little sense to treat and waste.

Using reclaimed water

Against this background, the State Board determined that good water management policy dictates that reclaimed water be considered as an important source of water supply. The Reclamation Policy and Action Plan for California is its response.

Initially, the Board intends to concentrate its efforts to implement wastewater reclamation in water-short coastal areas of the state. There are two reasons for this decision: These are the areas where the highest production of treated wastewater occurs, and these are also

areas highly dependent on an imported source of water.

The greatest use potential is expected to be for industrial purposes (primarily cooling), irrigation, and ground-water recharge. There are no plans to include reclaimed water as part of the domestic water supply, because many questions first must be resolved. The research and demonstration program called for by the Policy and Action Plan is aimed at learning more about the health effects and environmental impacts associated with long-term use of reclaimed water. As part of the Action Plan, and following the recommendations of a consulting panel of nationally known experts, the Board is recommending \$4.2 million in research and demonstration projects to be conducted over a 5-year period. In addition, it is recommending to the Legislature that additional research funds be made available as part of the next Clean Water Bond issue that the Legislature is expected to submit to the people in 1978.

Water reclamation projects

Today there are about 194 water reuse and reclamation projects throughout California using treated water for agriculture, landscape irrigation, artificial lakes, industrial and power-plant cooling, and ground-water recharge. Approx-

imately 34 more projects are in the planning or construction stage using federal and state monies provided through the Clean Water Grant Fund, and other projects are being built with private funds. For the most part, all of these projects are small, producing from 0.01 to 15 million gallons daily (MGD) of reclaimed water.

Now, with the Policy and Action Plan, we are in a position to move ahead, so that in the competition for funds reclamation projects will be given a higher priority.

We are not asking anyone to drink reclaimed water. We are not asking anyone to degrade their ground-water basins. We are not asking anyone to surrender their water rights. We are asking that reclaimed water be given its rightful recognition as part of the total water resources of the state so that it can be managed in the most comprehensive and intelligent manner possible.

Copies of the plan and other information on reclamation are available upon request by writing the State Water Resources Control Board, P.O. Box 100, Sacramento, California 95801.

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Wildlands and watershed management

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California foothill and mountain watershed lands are the primary runoff-producing areas in the state, yielding about 95 percent of the usable water supply. Nearly 65 million acres of forests, brushlands, and mixed woodlands and grass areas comprise the state's wildlands. Of these, the vegetation zones most adaptable for multiple land-use management are the brush (chaparral) and woodland grass cover types. These areas are generally situated in the lower and intermediate elevations on the mountain slopes surrounding the agricultural valleys and are used principally as rangelands. Surveys of vegetation and land use indicate over 30 million acres of such lands could be managed to enhance their productivity for watershed protection and water yield, as well as forage and wildlife habitat.

The potential benefits for water-resource conservation and for rangeland improvement have long been recognized and programs of vegetation control and conversion have been applied to over 2 million acres in California. Results of these programs, executed cooperatively

by landowners and managers on both private and public lands, have been highly successful in achieving gains in range production and in modifying hydrologic characteristics to generate additional runoff waters. Studies by water scientists, hydrologists, ecologists, and agronomists have confirmed the water yield increases on pilot tests conducted throughout the state.

Quantitative studies of the hydrologic responses of watersheds where dense vegetative cover has been replaced with range and forage grasses have consistently shown increases up to 50 percent or more (equivalent to 3 to 5 acre-inches per acre) in annual runoff over long periods of measurement. These runoff studies cover the variety of conditions found in northern and central California, and have also been confirmed under similar conditions throughout the world. About half the yield increase occurs in the latter portion of the season, giving usable flow in dry periods. The balance of the increase is produced as increased outflow during the post-storm periods.

The most effective responses in

terms of both range production and water-yield augmentation have been gained on sites where annual precipitation is greater than 15 to 20 inches. About 10 to 15 inches of rainfall are generally required to satisfy the moisture storage capacity of watersheds before any effective increases in runoff can be derived.

Well-planned and well-executed treatment programs on watersheds also have demonstrated that: (1) the runoff produced is of good quality and (2) by careful evaluation of site conditions, vegetative conversions may be conducted without environmental degradation.

In addition, wildfire risk is reduced through reduced fuel concentration and greater accessibility to remote sites for control of wildfire, and livestock water supply is better distributed on ranges, both in location and in availability throughout the season. Evaluation of these and other beneficial aspects of vegetation control indicates increasingly favorable economic assessments of the cost-effectiveness of wildland management programs.

In developing multiple land-use