

will be dependent on the water demands in the given year, reduced by the conservation opportunities the entities have to provide additional supplies in dry years. The dry year options are expected to include land fallowing opportunities, groundwater importation, and recovery of water that had been previously banked within California or possibly in the Arizona Water Bank. The combination of these programs may yield as much as 250,000 acre feet per year in California. SNWA would probably rely on recovery of water from the Arizona Water Bank as its dry year option and would be required to reduce its surplus demand above 300,000 af by one-half.

The partial M&I surplus tier will be implemented when Lake Mead storage is between elevation 1125 and elevation 1145 (15.585 maf). The volume of the partial M&I surplus will vary yearly and will decline over time as California proceeds toward its 4.4 maf legal entitlement. It will be equal to the volume needed to deliver 1.212 maf through the MWD Colorado River Aqueduct, considering the amount of core transfer programs already in place, less 250,000 af. When California has reduced its demand to 4.65 maf or lower, the extra water made available through the partial M&I surplus tier will be zero.

### 3.) Full M&I Surplus

During periods when Lake Mead content is above elevation 1145, but less than the amount which would initiate a surplus under the space building or flood control criteria described below, limited surpluses would be declared that would meet the goal of keeping the Colorado River Aqueduct full and meeting the needs of the SNWA. The volume of this surplus, as it relates to the Colorado River Aqueduct, would be the difference between the amount of water necessary to keep the aqueduct full (1.212 maf) and the amount that MWD already has available to it from sources within California's 4.4 maf basic apportionment. MWD's available supply includes its own priority 4 and 5 entitlements under the Seven Party Agreement, the amount conserved through core conservation programs that have been implemented, and any unused apportionment from more senior California contractors. The overall Lower Basin surplus, i.e. the amount of delivery above 7.5 maf, would also be reduced to the extent there is Arizona or Nevada unused basic apportionment. The volume of water available to SNWA would be that amount needed for M&I purposes within SNWA's service area above Nevada's basic apportionment of 0.3 maf. Current projections indicate that SNWA may not need additional surpluses until about the year

2005. Surpluses made available under the full M&I surplus tier would only be used for delivery to meet direct use needs in that calendar year and may not be used to refill carryover storage in off-mainstream reservoirs or for groundwater banking programs.

4.) **Additional Surpluses Based on Space Building to Contain Above-Average Runoff**

This tier refers to interim reservoir operating criteria that will allow additional surplus amounts to be made available to create reservoir storage space in anticipation of above normal runoff. A surplus strategy based on enhanced space building criteria was proposed by the Bureau of Reclamation based on studies performed following the 1983 flood events on the Colorado River. In January, 1986, the Bureau issued a special report titled Colorado River - Alternative Operating Strategies for Distributing Surplus Water and Avoiding Spills. This report suggested operating strategies for avoiding Lake Mead spills that went beyond the Corps of Engineers flood control criteria, but were, in essence, based on similar principles. Under these criteria, limited surpluses would be determined based on the need to provide adequate storage capacity for an assumed runoff rather than the actual yearly forecast. The Six States propose that the assumed runoff be the value of the 70<sup>th</sup> percentile of exceedance based on the historic record which is equivalent to about 17.331 maf runoff above Lake Powell. Technical studies have named this strategy "70R."

In recent years, the Bureau of Reclamation has investigated a number of surplus strategies including "spill avoidance," "flood control avoidance," and "shortage avoidance." All of these methods have positives and negatives associated with them. The Six States believe that the "70R" strategy is the best for use during this interim period because any surplus water provided is incremental to the previous tier of a full M&I surplus. In other words, the surplus strategy is not necessary to provide additional water for high value M&I uses since those needs will have already been met. The increment of use that could be available above M&I would likely be for additional groundwater banking and perhaps additional agricultural water in California, Arizona, or Mexico. The Six States do not believe it is prudent to apply surplus strategies that make additional water available based on statistical spill avoidance analysis which will present a higher risk, if the incremental water benefits are limited to groundwater banking and agricultural purposes. The Six State proposal will make water available for such purposes in years when the "70R" strategy

indicates that additional water should be released for beneficial use in lieu of potential release through the flood control criteria. If incremental surplus volumes are limited under this tier, priority must be given to groundwater banking for future M&I needs within California over agricultural uses. Agricultural uses in California should be limited to those years when the "70R" criteria results in large surplus volumes and there is a high degree of certainty that water would otherwise be subject to spill.

5.) Flood Control criteria

This tier refers to the current Corps of Engineers criteria for space building in Lake Mead that is necessary to avoid damaging levels of downstream flood releases. The flood control criteria is not, per se, a surplus strategy. Rather it is a strategy to use reservoir space to be able to reduce peak inflows so that outflow rates can be reduced to non-damaging levels. The surplus strategy relationship develops when the Corps criteria call for reservoir releases to be made at levels above downstream delivery requirements. Rather than let that volume be spilled to the Gulf of California, this tier of surpluses are designed to allow increased beneficial use in the Lower Division States and Mexico.

The Corps has defined specific volumes of storage space that must be left vacant during certain months of the year depending on forecast volumes to accommodate spring runoff or other unanticipated weather events. They have also mandated specific release rates by month to achieve these vacant storage spaces. In order to avoid the "dumping" of water in order to build storage space, provisions will be made which would allow the Lower Division States to schedule additional water for delivery. The volume of extra water available for delivery is equal to the amount that must be evacuated from storage, above regularly scheduled downstream demands, to meet the space requirements. Under some conditions, such as when the reservoirs are starting the year very full and when the forecast runoff is above average, the amount of flood control release could be several million acre feet. Under other circumstances, the space building formula may be such that only small volumes of water would need to be evacuated. However, since flood control related releases are generally associated with very full reservoir conditions, the Six State proposal would allow any and all beneficial uses to be met, including unlimited off stream groundwater banking and additional water for Mexico.

## V. Shortage Determination Criteria

The Six States believe that considering current reservoir conditions and with prudent system management, the Secretary of the Interior should not have to declare a shortage condition for many years. Even with this recognition, the Six States believe that the establishment of shortage criteria that work in conjunction with the interim criteria is valuable for two primary reasons. First, the Arizona Water Bank has been created within Arizona primarily to store water underground over the next twenty years to mitigate the effects of future shortages to Arizona municipal water users. Shortage criteria are critical for Water Bank planning. The volumes of water that Arizona will withdraw as either basic apportionment or surplus apportionment over the next ten to twenty years is highly dependent on the need for water banking that will be used as shortage protection. Secondly, shortage criteria are needed to be able to identify any negative impacts created by the implementation of the temporary surplus criteria. All Six States, and especially Arizona and Nevada, want to be able to identify when the release of water to California from either the partial or full M&I surplus tiers, causes an increased risk of shortage. This analysis can only be performed if the shortage criteria are known.

The Bureau of Reclamation has been studying options for shortage criteria for a number of years. The framework for most of these strategies is to declare limited cutbacks well in advance of the point where those levels are critical. The most junior Lower Division water user, the Central Arizona Project, bears the burden of most of the delivery reduction. The timing of the reduction is based on the use of computer models to simulate reservoir operations. The model study focuses on the statistical probability of reservoir levels dropping below a critical "protect" level. The Six States endorse this framework and propose to adopt the protect level in Lake Mead of elevation 1050 (7.471 maf content) which is the elevation of the intake structure for the Southern Nevada Water Project. The Bureau of Reclamation has named this shortage strategy "80P1050." In accordance with the Bureau's studies, this level would not be guaranteed but the risk of drawing down to below that level would be limited to 20%. When the model studies indicate that the reservoir level is in jeopardy, a first tier shortage would be declared which would reduce Arizona's consumptive use by the CAP and other similar priority users to no more than 1,000,000 acre feet (about a 500,000 af reduction). Nevada would also share in shortages, but to

a much more limited extent. If reservoir conditions continue to deteriorate, additional cuts in use by CAP will be required.

## VI. Overrun Accounting

The Draft California 4.4 Plan includes a provision that allows individual entitlement holders to exceed their yearly apportionment. The proposed overrun would be constrained by a maximum allowable accrual and would be subject to repayment in subsequent years. The overrun accounting provision is tied to the administration of agricultural entitlements.

The Six States are concerned with the overrun provisions. First, as the Colorado River enters into an era of limits, the States expect the Bureau of Reclamation to strictly enforce its contracts and the entitlements. In essence, within the Lower Basin, the Bureau must play the role of the State Engineer and enforce current limits on diversions by water users. Secondly, the Six States are leery of proposals that would allow significant diversions above the amount of water allowed to a state in shortage, normal, or limited surplus years according to the proposal described in this paper. It would be extremely inequitable to allow California agricultural districts to overrun their diversions by 10%, which is over 300,000 acre feet, while at the same time calling for the Central Arizona Project to reduce diversions by 500,000 acre feet because a shortage had been declared.

In spite of these significant concerns, the Six States do recognize that there may be limited occasions when inadvertent overruns will occur. Due to the fact that the annual entitlement of a junior priority district is dependent on the actual use by a senior priority user, there may be occasions when a district will order water only to find out later that it had exceeded its contract entitlement. This matter is further compounded in the Lower Basin because a state's apportionment is for consumptive use rather than diversions. Until the books are reconciled to calculate diversions less measured and unmeasured return flows, it may not be possible to know whether or not an overrun has occurred until the after-the-fact accounting is completed.

The Six States propose that a limited form of overrun accounting be instituted. It must be based on the following principles:

- 1.) Overruns must be inadvertent.

- 2.) Overruns may not exceed 7% of annual entitlement.
- 3.) Overruns must be repaid the following year by the entity that benefitted from the extra water unless the following year's operation is controlled by the flood control regulation and water must be released beyond downstream demands.

#### **VII. Control of Illegal Diversions and Uses**

The implementation of interim reservoir operating criteria cannot stand alone in the water management of the Lower Colorado River. The Six States' concern about California's continuing use of Colorado River water above its basic apportionment is an indicator that they believe that the era of limits in the Lower Basin has begun. In order to implement and enforce these limits so that other states or individual water entitlement holders are not adversely impacted, the Bureau of Reclamation must move forward with its identification of Lower Basin water users who are either exceeding contract entitlements or are diverting water without a contract. The Bureau must take steps necessary to require more accurate measurement and reporting of diversions. It must also develop accurate techniques for determining both measured and unmeasured return flows to the river. The issues of withdrawal of Colorado River water from wells must be dealt with either by adopting a modified version of the "bright line" approach currently being considered by the Bureau or by some other scientifically and legally valid approach. The Bureau must consult with the affected states and water users before proposing any final regulation, but it should establish a schedule and process to undertake this necessary step.

#### **VIII. Conclusion**

The Governor's representatives of the States of Arizona, Colorado, Nevada, New Mexico, Utah and Wyoming have stated on numerous occasions their desire to work with representatives of California to develop and implement a plan that will, over time, eliminate California's dependence on Colorado River water above its 4.4 maf basic apportionment. One critical component of that plan is the implementation of interim Lake Mead reservoir operating criteria that will provide California M&I entities greater security of supply through the Colorado

River Aqueduct than currently exists. The Six State Representatives conditioned their willingness to work on mutually agreeable interim operating criteria on California's commitment to enter into a defined, enforceable program to reduce its dependence on Colorado River water over its basic entitlement in a way that avoids undue risk of shortage to other Basin States. While California has not yet completed the 4.4 Plan that will create the framework for the defined, enforceable program that the Six States require, it has made meaningful progress. In recognition of that progress and in order to move the discussions forward, last October the Six States set forth their principles for defining the interim operating criteria. They have now added additional explanation and detail to those principles.

The Six State proposal is based on a number of legal and policy considerations. Critical to these considerations is that the interim operating criteria must be accomplished within the existing "Law of the River." Also, any risk of future shortages resulting from the interim operating criteria must be borne by those who benefitted. The proposal for surplus determination is similar in approach to that proposed in the December 1997 Draft California 4.4 Plan, but contains differences in several of the specific provisions. The Six States also believe that issues of shortage criteria, overrun accounting, and control of illegal diversions and uses must be addressed and have suggested how those issues should be resolved.

The representatives of the Six States believe that this proposal should be viewed as a positive step toward the successful completion and implementation of the California 4.4 Plan. They believe the time has come to expedite discussions with California's representatives on these critical Colorado River issues.